Research on Legal Regulation of Infringement of AIGC Generated Content

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Abstract. With the rapid development of generative artificial intelligence technology, the infringement problems involved in the generated content of AIGC have attracted much attention, especially copyright infringement, unfair competition and anti-monopoly, and infringement of trade secrets. In order to effectively solve many problems in theory and practice, it is necessary to start from the operation principle of AIGC, deeply explore the root causes of AIGC infringement problems, and improve the risk source management mechanism, build a work management mechanism, improve the evidence collection mechanism, build an integrated governance mechanism and other measures. At the same time, make full use of blockchain technology, expert assistance system and other ways to effectively control the infringement of AIGC generated content.

Keywords: AIGC; Acts of infringement; Blockchain; Legal regulation

1 Introduction

AIGC (AI-Generated Content), namely generative artificial intelligence, is a new mode of content creation with the gradual maturity of PGC (professional Generated Content) and UGC (user generated content) technologies. Its main feature is that it can make full use of artificial intelligence technology to automatically generate text, audio, video and other types of content according to user needs or specified keywords, themes and other content. From the perspective of the generation process, the formation process of such content can be divided into four stages, as shown in Figure 1 below.

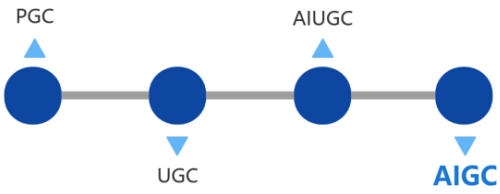

Fig. 1. The four stages of content generation

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Compared with PGC and UGC, AIGC is a rapidly rising new technological achievement in the field of deep learning algorithms, which has injected strong impetus into the release of factor dividends, accelerate the upgrading of traditional industries, promote the rapid development of the digital economy, and build a metauniverse world with virtual and real symbiosis. Of course, there are also legal risks that cannot be ignored in the operation of AIGC programs such as data collection and machine learning, especially whether it constitutes infringement. For example, in January 2023, three writers in the United States filed a class-action copyright lawsuit against Stability AI for copying more than 12 million Getty Images photos and metadata of related titles. For another example, in August 2023, the Beijing Internet Court publicly tried a case of "AI Vincennes Diagram", in which whether the picture of the person generated by the plaintiff using the Stable Diffusion AI drawing model constitutes a work and whether the act constitutes an infringement has become the focus of dispute. This paper analyzes the operation principle of AIGC, discusses the factors that lead to the infringement of AIGC, and takes measures such as building and perfecting the risk source governance mechanism, building the works management mechanism, improving the evidence collection mechanism, and building the integrated governance mechanism, so as to provide some benefits for the intellectual property infringement governance of AIGC.

2 AIGC Operation Principle Analysis and Infringement Risk

2.1 Definition and Operation Principle of AIGC

2.1.1 Definition of AIGC

Generally speaking, the understanding of AIGC is divided into narrow sense and broad sense. In a narrow sense, AIGC is the use of artificial intelligence automatically generated content; In a broad sense, AIGC can be regarded as an intelligent technology that can produce and create similar to humans. For example, the generative artificial intelligence of ChatGPT can independently generate new content through learning and training of large amounts of data. The difference between AIGC and other generative AI is mainly reflected in the fact that AIGC has a more powerful database and algorithm foundation, and meets the needs of different users in a way of "reinforcement learning based on human feedback". From the practical situation, AIGC has been applied to different industries such as e-commerce, entertainment, design, art and so on.

In July 2022, Baidu CEO Robin Li proposed at the Baidu World Conference that the development process of AIGC is divided into three stages, namely: assistant stage, collaboration stage and original stage. At present, AIGC is still in the assistant stage and is mainly used as an auxiliary tool to help people complete the construction of their works, which is reflected in the following three aspects:

First, text processing. AIGC uses web crawlers to capture a large amount of text data, complete new text generation based on natural language processing mode, or carry out multi-language conversion to create barrier-free communication, and then meet the generation needs of different users, such as LinguaBot, Copy Genius, etc.

Second, image processing. The works in the database are analyzed and imitated by means of deep learning, and the learned styles and skills are applied to the generation of new works, and unique works of art and style are generated. For example, ArtCreativity not only provides a platform for artists to communicate and discuss, but also plays an important role in inspiring creative inspiration.

Third, content generation platform. AIGC has a wide range of applications by imitating human perspective and generating content logically. For example, the chat-based robot represented by ChatGPT can realize multi-text tasks and effectively communicate with users; CodeGenius uses multiple programming languages to quickly generate code frameworks, saving programmers and developers a lot of programming time.

2.2.2 Operation Principle of AIGC

As a new technology, AIGC's operation program is more complex, so as to meet the needs of users. The specific generation process is shown in Figure 2.

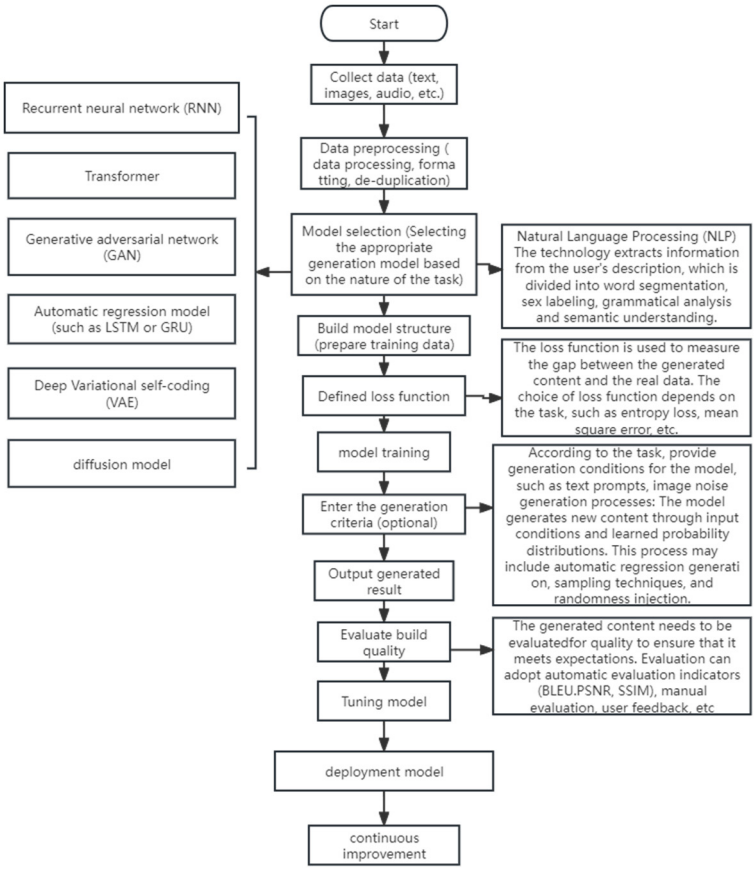

Fig. 2. AIGC operation flow chart

From the above flow chart, AIGC can be technically divided into three parts: First, the real content is converted into digital form through crawler technology. In this process, enhancement and translation are involved, the former refers to the details of the original content, such as noise reduction, repair, etc., while the latter is the conversion of modes, such as audio into subtitles, video audio extraction and so on. Second, the content is decomposed to provide basic information for subsequent operations. Third, the content generation, through the study of the data and the understanding of the abstract concepts contained in it, so as to generate the relevant content.

In terms of generated content, it can be divided into text, image, audio, video and multimodal generation. First, text generation can be divided into non-interactive generation, such as content summary, article generation, etc. In addition, there is another kind of interactive generation, such as the use of more extensive AI chat tools, ChatGPT, domestic Wenxin Word, C know and so on. Second, image generation can be divided into image editing and modification and automatic generation of images, editing and modification include intelligent matting, face replacement, etc., while the automatic generation of images is completely completed by AI after instruction guidance or learning. Third, audio generation is widely used in many platforms such as short video, including phonetic conversion of text, replacement of existing audio, etc. In addition, it is also widely used in the field of manual customer service. Fourth, video generation is also divided into video editing and self-generation, which is similar to image generation. Fifth, multimodal generation is a combination of the first four modes, such as video generation, audio to text, etc.

AIGC's core technologies include deep variational self-coding , generative adversarial neural networks, Diffusion models, transformers, and Vision transformers. First of all, the variational autoencoder belongs to the deep generation model, which is divided into encoder and decoder. The encoder is used to calculate the probability distribution of the original high-dimensional data, while the decoder is reconstructed according to these data to generate new data. Secondly, the adversarial neural network is divided into two parts: generator and discriminator. The generator is used to generate content, while the discriminator is used to judge whether the content generated by the generator is reasonable, and the result is fed back to the generator. These two parts cooperate with each other and generate more realistic data through continuous repetition. Thirdly, the diffusion model was originally used for noise reduction, but now the image can be generated by only input noise. The whole process is divided into forward diffusion and reverse diffusion. Forward diffusion is to add noise to the image and destroy the data, while reverse diffusion is to learn how to remove noise and restore the image.

2.2 Infringement Risk of AIGC

The operation of AIGC relies on a large amount of data and scientific algorithms, and properly uses and processes relevant data, which has become an important basis for the standardized use of such generative artificial intelligence and its application to more fields. However, judicial practice shows that there are infringement risks in the operation of AIGC at present, which are mainly manifested in three aspects: copyright infringement, unfair competition and anti-monopoly, and infringement of trade secrets.

As we all know, in the era of open and shared data resources, data barriers have been broken. In order to fight for data resources, crawler technology came into being, that is, the use of automated programming programs, engine search. AIGC relies on the original data to generate instructions, and repeatedly captures data through crawling technology to simulate the user's browsing mode. At the same time, it can effectively analyze the user's target requirements, and then filter and analyze the data. However, in this process, the capture of data is uncontrollable, and it is likely to capture unauthorized or existing copyright works, resulting in copyright infringement. "In addition, in the process of data crawling, if the crawling party fails to comply with the Robots protocol set by the data right party and other obligations that should be complied with, or the crawling party technically breaks through the Robots protocol of the website or App, as well as the crawler detection and reinforcement of the Web site to restrict the crawler's access rights, Since the purpose of such crawling of data is to replace part of the product or service of the data owner, it may be considered an act of unfair competition."[1] In addition, in the input stage, users may be suspected of disclosing trade secrets when entering keywords and other restrictions in order to achieve accurate content generation and meet their use needs. According to the provisions of Article 4, paragraph 5, of the Provisions of the Supreme People's Court on Several Issues relating to the Application of Law in the Trial of Civil Cases involving Infringement of Trade Secrets, where the relevant personnel in the field can obtain the trade secret from other open channels, the people's court may determine that the trade secret has been known to the public. It can be seen that if the user's data in the process of target description and definition is used by AIGC in model training, it is likely to constitute an infringement of trade secrets.

In addition, while the AIGC can take steps to avoid the risk of infringement in the input phase, "expressive use" for technical reasons in the output phase may still constitute infringement. "Generally speaking, in the process of determining infringement, China often adopts the standard of 'contact + substantial similarity', that is, if the content of the output of artificial intelligence is substantially similar to the original work, and the permission of the copyright owner is not obtained in advance, it can be identified as copyright infringement."[2] In accordance with Article 13 of the Copyright Law of the People's Republic of China (hereinafter referred to as the "Copyright Law"), where individual creation is made by adapting, translating, annotating or arranging the works of others, the copyright in the new work shall be enjoyed by the creator of the work, provided that the copyright of the original owner of the work shall not be infringed upon in the exercise of the copyright. From the perspective of operation principle, AIGC is based on machine learning in mode setting. In an ideal state, big data is integrated and analyzed, and new valuable works are quickly generated in large quantities by simulating human mode. However, practice shows that the content generated by AIGC is largely "expressive use", that is, the content of original works is changed and multiple works are integrated. From this point of view, the newly generated works do not produce new connotations and values, and this behavior is likely to constitute copyright infringement.

3 Analysis on the Causes of AIGC Infringement Management Dilemma

3.1 "Draft Washing Training" Adds Difficulty to Rights Protection

The so-called "draft training" refers to the integration and analysis of multiple data to generate their own content system. In the process of content generation of AIGC, there is no shortage of "manuscript washing training". This technology infringes the legitimate rights and interests of right holders, but also increases the difficulty of rights protection.

First of all, AIGC applications are flooded with good and bad "manuscript washing" and pseudo-original tools, and many applications directly collect articles from web pages, and complete "manuscript washing" by modifying titles, synonyms, paragraph order and other means. In practice, "because the completion, publication and dissemination of works are mostly carried out through the Internet platform, the relevant electronic evidence is also generated and stored on the Internet, which is easy to be deleted, easy to be tampered with, easy to forge and not easy to leave traces" [3] Further through the "handling" and forwarding of different platforms, it is very difficult for victims to find the infringing subject and evidence of infringement. At the same time, the cost of a lot of economic costs and time costs may eventually obtain the result of the judgment is not satisfactory, which is also the reason for the wantonly growth of many "manuscript washing" works.

Secondly, there are cheap "pirated software" in AIGC applications, which encourages users to use it for content generation in the name of AIGC automatic generation. These software due to the low cost of opening a website and application, it is often easy to "resurface", and once the website server is set up overseas, without ICP filing, it is easy to form a secret "gray industry chain", resulting in difficulties in the protection of the rights and interests of the victims. On the one hand, if the content generated by these "draft washing" software is captured twice, the possibility of infringement has been generated from the source of the data. On the other hand, the content generated by these software does not meet the requirements of fair use, but due to the large number of databases and high camouflage characteristics, it is difficult for right holders to obtain favorable evidence for effective rights protection, which leads to difficulties in rights protection.

Finally, in judicial practice, the court's recognition of the act of "manuscript washing" is too vague, resulting in the lack of practical recognition of the act of infringement. "Generally speaking, for the copyright infringement judgment criteria of 'manuscript washing', the main nowadays is' contact + substantial similarity ', and the focus is on the identification of substantial similarity."[4] As far as access determination is concerned, if the copyright owner's work has not been published, it is necessary to prove that the infringer does have certain opportunities and conditions to access the right work, which is often difficult to prove. "In terms of substantive similarity, because there is no specific identification standard, the concept of substantive similarity is easy to cause problems such as too much flexibility, poor operability, and large subjective risks."[5] At the same time, laws and regulations lack clear provisions on how much

similarity should be recognized as substantial similarity. In view of the above factors, the measurement of similarity and originality is often difficult to identify in judicial practice, which greatly reduces the probability of the victim's right to win the lawsuit.

3.2 Whether AIGC Constitutes a "Fair Use" Exemption is Disputed

In the metacomes mode, AIGC relies on pre-trained models and its own database for commercial services. In many infringement cases, "fair use" is often used as the defense of infringement, but whether fair use can be used as the condition of tort exemption is still controversial.

"Data acquisition - model training - data generation", as a necessary step in the content generation of AIGC, has caused the blurring of the boundary of fair use. First, in the data acquisition stage, natural language processing technology extracts the main information from the user's description, and its nature is to perform commercial services for unspecified agents. According to the fair use principle stipulated in Article 24 of the Copyright Law, there are three conditions that comply with the AIGC's operation: "First, the use of others' works for personal study or appreciation only; The second is to appropriately quote others' published works in their own works; Third, it should only be used in the public domain such as classroom teaching or scientific research in the professional field, and it should be used as little as possible to copy or adapt the works that have been published by others, and only for the use of teaching staff or scientific researchers in the relevant field, and it should not be published and distributed." AIGC cannot determine at the beginning of the collection of information whether the user is motivated by personal learning needs, let alone know its later use. Second, in the process of model training, both GPT-3 and DALL-E-2 models "cannot avoid that AI, in addition to mining publicly available data, uses technology to extract undisclosed and authorized data, according to the 'three-step test method' of fair use, such behavior damages the legitimate rights and interests of others and breaks the boundaries of fair use"[6] It also violates the requirements of the principle of proper reference to the works of others in the Copyright Law. Thus, from the perspective of China's legal provisions, the content generated by AIGC does not constitute a waiver of liability in the case of fair use.

In the United States, although secondary creation is encouraged, the fair use of AIGC data training and its generated content is still questioned by many scholars. For example, in the Stable Diffusion case, according to its prior art, the generated content is only a slight modification of the original work, and does not create new value. According to the Copyright Act of the United States, whether the use of a certain work is in line with fair use, the "four-element analysis method" is used to analyze AIGC. The content generated by the training of massive data has strong commercial color, and the value of the generated content cannot be guaranteed to increase, and it will become a "complex collage tool" to a certain extent. Does not meet the application of fair use.

Of course, some scholars have proposed that in the input stage of AIGC, "the key to whether it constitutes a 'transformational use' is whether the purpose of use is consistent with the purpose of creation of the original work: when the purposes of the two are

inconsistent, it can be identified as fair use" [7] If it constitutes a "conversion use", it shall be deemed fair use and exempted.

In general, although it is controversial whether AIGC can constitute a "fair use" exemption, it is undeniable that once the content generated by AIGC meets the applicable situation of fair use, on the one hand, it can effectively promote technological innovation and promote the rapid development of artificial intelligence industry; On the other hand, the content generated by AIGC may occupy the original work market to a certain extent, and have a certain impact on the intellectual property governance in this field.

3.3 Strong Professionalism Causes Difficulties in Obtaining Evidence and Identification

In view of the complexity of AIGC technology, the data model, automatic learning, web crawler and other technologies that it relies on to generate content show strong professionalism. Therefore, the evidence obtained is highly professional, which makes it difficult for the right holder to obtain evidence and identify the authenticity of the evidence, which increases the difficulty in the examination of the appraisal opinion, and the fairness of the determination result is inevitably questioned.

First of all, the infringement of most works requires electronic evidence to prove, and electronic evidence is particularly important in the field of AIGC. However, due to the characteristics of digital electronic evidence, its data content is stored in the carrier of computer equipment, which is easy to be modified, and it is difficult to consider the identification of legitimacy, authenticity and relevance. In addition, compared with traditional evidence, electronic evidence involves a large amount of content, and it is easy to cause the lack of data link in judicial practice and the miscarriage of justice when its evidential ability cannot be determined. At the same time, the collection of electronic evidence is highly professional and requires special personnel to ensure the originality and integrity of electronic data.

Secondly, the process of evidence operation includes evidence collection, evidence presentation, cross-examination and certification, and certification, as the most critical link, determines the outcome of the trial. Electronic evidence is an important basis for case judgment, and the personal ability and experience of judges directly affect the result of discretionary judgment, which enhances the discretionary power of judges and is not conducive to judicial justice. Therefore, evidence certification in the field of AIGC is in urgent need of professional identification and verification of the legality of identification, in order to achieve double assurance and provide scientific opinions for judges' adjudication activities.

Electronic evidence is indispensable in the era of Internet big data, so how to ensure the legitimacy of evidence and the accuracy of identification has become the focus of attention of AIGC to generate content infringement evidence, but also caused a governance dilemma.

3.4 The information Data Barrier is a Constraint on the Governance of the Generated Content of AIGC

In the digital age, digital platforms provide a basic stage for the trading of digital works, and artificial intelligence-generated content is gradually evolving in the digital. "As one of the important data sources for industrial competitive intelligence analysis, intellectual property information is also an important driving force for the innovation and development of industrial clusters driven by data elements."[8] For the infringement determination in artificial intelligence, there are many difficulties:

There is a certain difficulty in inter-departmental cooperation between judicial organs. There are barriers at different levels in the current digital justice field. Judicial data application platforms of different regions, institutions and functions lack a data interoperability mechanism, and there are problems of different architectures and data impassability with the application platforms of financial and communication institutions and departments, which leads to the failure of data circulation. For the governance of the content generated by AIGC, it is necessary to build data flow in different fields and levels according to the connectivity of big data. In order to ensure that when the infringement occurs, the judicial organ can obtain the source of the infringement data and investigate the warrant in time. At present, judicial activities that require multi-party cooperation such as obtaining evidence and case execution have to continue to "go through procedures" to frequently request data support and apply for cooperation from relevant departments. It not only increases the judicial cost, but also makes the judicial process more complicated. The data capture of the content generated by AIGC has a wide coverage and involves many fields, and the data between various departments and governments are not open. Although the security of internal data is guaranteed to a certain extent, it brings many unnecessary troubles to the collection and collection of evidence in the case, which may lead to the occurrence of situations where complete evidence cannot be formed. In addition, the government data of the upper and lower levels of the department is one-way flow. In the investigation, it is found that the main problem of government data sharing between the upper and lower levels of the department is that the data can only flow one-way, and the upper level can obtain the government data of the lower level, but the lower level cannot obtain the government data of the upper level, which is easy to cause the lower level organs can not timely understand the policy changes of the higher level organs, and the process of handling the process is not simplified in time. [9] With the rapid development of AIGC as an emerging technology, different organs make policy changes in accordance with the development, so the non-circulation of data will lead to lower organs still maintaining the original process, and the cumbersome process will increase unnecessary time and money costs.

Under the traditional procuratorial system, in the process of exercising the functions of case handling and legal supervision, the procuratorial organs have the problems of dispersing power, acting independently and acting independently. The barrier data of information data leads to the inability of effective connection between case handling and legal supervision, which weakens the function of case handling and legal supervision to varying degrees.[10] Moreover, in the field of judicial adjudication, the judicial

data of different litigation service platforms exist in a state of fragmentation, and the data transmission between different courts cannot be timely and effective, which will lead to a lag in the docking of cases. Judicial data is also difficult to be effectively used. In the substantive analysis of relevant evidence, due to the lag of data and the lack of technical personnel to analyze the data, the substantive determination of the tort cannot be timely and accurate, which greatly increases the time risk of the victim.

4 AIGC Generates Measures to Improve the Governance of Content Infringement

4.1 Build an "Input and Output" Stage Risk Governance Model

4.1.1 Input Side: Strengthen Data Risk Control

To strengthen data risk management and control, the core lies in strengthening the security guarantee of data "controllability", including data with large-scale flow, aggregation and analysis into risk management and control, and avoiding the arbitrary copy and extraction of data by "manuscript washing training". Through the analysis of highly sensitive data, the data that is harmful to intellectual property rights is mined from the root, so as to achieve the following effects: first, to strengthen the effective control of data flow and aggregation, to avoid illegal data being included in the AIGC database, which will be integrated and lead to infringement; The second is to reduce the infringement possibility of AIGC input at the source and improve the market access system.

Of course, to avoid the inclusion of illegal data in the AIGC database, it is necessary to realize the supervision and management of data in different fields, establish a real-time dynamic monitoring platform to judge the network risks brought by crawling technology, and then scientifically and accurately conduct early warning and prevention and control. In addition, the operating company should also conduct risk prediction of the data, timely detection of security risks, internal governance of infringing data, and form a joint governance system with government agencies.

In addition to risk warning, in view of the actual situation of the rapid development of new technologies such as AIGC in China's market, government agencies should strengthen the system optimization of data security assessment, access and compliance review, improve market access, and block illegal data from entering the market. Outside the region, the European Union's latest artificial intelligence Act stipulates that artificial intelligence development institutions must submit assessment reports to government agencies, so that relevant agencies can review and put into the market. In this regard, China can draw lessons from practice, clarify that AIGC development institutions independently conduct data de-labeling and cleaning, ensure the legality of data and model training, and regularly conduct compliance reviews of AIGC's database to avoid infringement risks.

4.1.2 Output: Optimize AIGC Generated Content Risk Management System from the Aspects of Technology and Standards

Since AIGC relies on data model to train output works, risk management is carried out on the output end from both technical and standard aspects.

Firstly, the generation mechanism of AIGC output is improved. AIGC's developers further identify the infringing content that their model may generate, using natural language processing and machine learning to improve the model. The model is used to automatically filter the infringing content and establish the infringement mechanism. When the system detects the infringement of generated content, it will be controlled at the first time to prevent generated content from flowing into the market.

Secondly, the development and application of AIGC should be regulated, the infringement of the generated content of AIGC should be prevented in advance, the generation standards should be formulated, the mechanism framework and process of risk assessment should be provided for its possible risks, and the countermeasures should be formulated to achieve the purpose of early prevention. The generated standards and countermeasures should have strong operability and realizability, so that relevant research supervisors can effectively realize risk management under the guidance of the program.

Although the Interim Measures for the Management of Generative Artificial Intelligence Services regulate generative artificial intelligence technology, as an emerging technology, AIGC is still deficient in the risk regulation of its generated content by legislation. Therefore, through the dual governance model of technology and standard, risk prevention is used to promote the governance of AIGC in order to promote the healthy development of emerging technologies.

4.2 Improve the "Works Management Mechanism" Under Blockchain Technology

4.2.1 Give Full Play to the Core Technical Advantages of Blockchain Technology

In essence, "blockchain is an electronic form of distributed shared ledger and database. Each page of the ledger corresponds to a node, and each node records the entire data information of the entire blockchain and is difficult to tamper with." [11]Therefore, the above technical principles ensure the security and transparency of blockchain technology, and apply to the governance requirements of the content generated by AIGC in the field of intellectual property.

First of all, the openness of blockchain technology ensures that the data is open to all users, and anyone can query the data carried in the blockchain in any public interface and apply it to related fields. Its extremely open and transparent technology ensures that the documents in the AIGC database are fully accessible to all users. Second, the blockchain network has a common blockchain area and is composed of multiple nodes, all of which have the same status and assume the same functions, and the information data is stored, updated and maintained by all nodes in a peer-to-peer manner. "Practice shows that the damage of individual nodes will not affect the overall operation of the data, the number of nodes will continue to increase and change with the advance of time, in theory, only destroying more than 50% of the blockchain nodes will lead to the

destruction of data, with high security".[12] At the same time, the traceability of the data is guaranteed. The use of blockchain technology to conduct "works management" on AIGC can effectively query the use records and sources of works, so as to ensure that when AIGC generates content infringement, the relevant data can be timely retrieved and traced, and the rights of relevant right holders are protected in the first time.

4.2.2 Build a "Works Management Mechanism" Under Blockchain Technology

Coupling blockchain technology with AIGC intellectual property field governance and building a "works management mechanism" can alleviate problems such as infringement of AIGC generated content on the one hand, and promote generative artificial intelligence to lead the development of technological innovation on the other hand.

At present, AIGC lacks the function of data query and search, and uses blockchain technology to establish a distributed ledger as the core of intellectual property data information database, with a network structure to ensure the accuracy and speed of data information search. After describing and defining the capture target, users can query the data used by the content generated by AIGC in time, thus breaking the asymmetry of information. This initiative will help AIGC-generated content data be made available to the public, saving users search costs and helping rights holders detect the use of unauthorized works.

In addition, the use of smart contracts to set up a work exit mechanism can also effectively protect the right to control the work. In the United States, the CCC model is used to grant copyright licenses to works in a simpler and standard way, forming a new copyright authorization model of "replication-distribution-modify - fusion - re-creation", which allows the right holder to set the applicable conditions and scope of use of the work according to its meaning within a reasonable range, and the user pays a certain fee to the right holder when using his work. In view of this, China can use the intellectual property data information database generated by the blockchain to establish a management system, by the developer and the right holder to write the smart contract code after consultation, the required terms are included in the contract, and the user pays the corresponding fees after using the work of the right holder. Secondly, an opt-out mechanism should be established. If the right holder prohibits AIGC from using the works it has not authorized, after the right holder submits the opt-out statement, the developer of AIGC should respect the opinion of the right holder, remove the works from the database, stop using them, and pay compensation for the infringement.

The "works management mechanism" under the blockchain technology builds a complete "entry-exit" mechanism, which avoids the infringement of the copyright of the right holder by AIGC from the root, and the establishment of the database is conducive to the timely detection of the disclosure of trade secrets by relevant enterprises, so as to reduce the losses caused by the widespread dissemination of secrets. After the realization of the digital operation of the blockchain, in addition to improving the performance effectiveness of the smart contract, it also prevents the unfair competition caused by the data party to replace some products or services of the data rights party.

4.3 Improve the Forensics System for the Content Generated by AIGC

4.3.1 By Improving the Electronic Evidence Investigation to Assist the Trial

In view of the difficulties in electronic evidence collection, the Supreme People's Procuratorate mentioned in the Attribute of electronic Evidence Determines the Method and approach of evidence collection that timely, professional, comprehensive and legal evidence collection is needed, and the process of evidence collection requires personnel who understand the characteristics of electronic data rules to conduct evidence collection, which should pay attention to the data in internal and peripheral equipment. On the basis of collecting the original data, auxiliary data such as data generation and modification time should be extracted at the same time. In order to ensure the complete evidence chain, it is necessary to reconstruct the data extracted from the application of AIGC to provide more intuitive electronic evidence to the trial personnel. So that it can intuitively judge the infringement according to the text, image and other information in the evidence, so as to reconstruct the case facts through the mutual confirmation of the evidence.

AIGC has a large amount of data in its database, and if such data is extracted and the authenticity of each item cannot be determined, it can be confirmed by ensuring the "particularity" and "integrity of the custody chain" of the carrier that stores the massive data and has storage value. When professionals extract evidence, the entire extraction process should also be videotaped, and the technology used should be explained to the judge to facilitate the judge to authenticate the evidence.

4.3.2 Improve the AIGC Evidence Identification by Improving the Expert Assistant System

In order to solve the difficulties of evidence identification caused by AIGC's strong professionalism, the expert assistant system is established, that is, the parties hire experienced experts in the field of generative artificial intelligence, approved by the court, to appear in court to provide relevant help and explanation for the parties in the field of professional issues, and express expert opinions, thus opening up a new model of evidence identification in the field of AIGC. This system will be responsible for the examination of expert opinions to professionals in the field, through the expert inquiry, with the professional knowledge they have mastered, assist judges and parties to examine the authenticity and reliability of expert opinions. Only in the Procedure law, the expert assistant has the right to face to face to question the expert opinions. With the help of expert assistants and appraisers to form confrontation and professional error correction mechanism in the trial, it can make up for the defect that the defense is unable to conduct substantive review of the appraisal opinions.[13]

Of course, only relying on the right holder to hire professionals, can not solve the root cause of the blind area of special professional fields of trial. A national database of expert assistants should be supplemented, and a team of expert witnesses dedicated to the field of generative artificial intelligence should be established to address AIGC infringement. According to the Civil Procedure Law, the parties may apply to the people's Court for appraisal on specialized issues, and the two parties shall consult together on the candidate for appraisal, or the people's court shall appoint an appraiser. In 2020,

the Beijing Intellectual Property Court set up a professional team to handle cases involving complex technical fact finding and determination. The AIGC intellectual property infringement field can fully learn from this move, through legislation to clarify the nature of the evidence provided by the expert assistant in the field of generative artificial intelligence intellectual property, what role its opinions play in judicial trial, the people's court can adopt the opinion of the expert assistant. Secondly, the expert witness team established must ensure that the expert qualification conditions are strong, the industry recognition is high, and the leave assistant is given the right to cross-examine from the legal point of view, so that it can fully cross-examine in the prescribed procedure to maintain the fairness of the trial. In addition, the trial process is guaranteed to be dominated by judges, and based on the mode of prosecution and defense litigation, expert assistants only question and provide expert opinions on issues in their own fields.

The establishment of the national expert auxiliary person database has eased the pressure on right holders to obtain evidence to a certain extent, and prevented right holders from facing the problem of infringement of the content generated by AIGC. Also further effectively solve the problem of difficulty in the examination of expert opinions in professional fields in judicial practice, so as to achieve the purpose of reducing the probability of misjudgment and misjudgment.

4.4 Build an Integrated Collaborative Governance Model

4.4.1 We Will Improve Judicial Protection of Intellectual Property Rights in the AIGC Field

As an emerging technology in the field of artificial intelligence, the relevant provisions in the field of intellectual property rights are not perfect, and there is no special legal interpretation and regulations. Therefore, on the basis of judicial practice, while promoting the legislation of expert assistance witnesses, the legal interpretation of technical disputes and intellectual property rights in the field of AIGC is established, and the constituent elements and manifestations of intellectual property rights infringement by AIGC are clearly stipulated, and the flexible and open identification system is set up. First, improve the AIGC technology under the copyright infringement, the use of trade secrets generated text, pictures and other infringement of trade secrets judgment. Secondly, combining the "four elements standard" judgment: the purpose and nature of the data used by AIGC to generate content; The corresponding nature of the original work; The proportion of the original content of the generated works; The impact of new works on the market value of original works. This will expand the scope of fair use and promote the creation of AIGC's works.

In addition, it is urgent to improve the anti-unfair competition and anti-monopoly system, "with the endless emergence of new economies, new forms of business and new models, the use of data, algorithms, platform rules and other implementation of new unfair competition behaviors need to be regulated."[14]

China's third amendment to the "Anti-Unfair Competition Law" in 2022, although added the commercial data unfair competition act clause, but still lack of judicial interpretation, should be combined with the relevant technical development laws in the field

of AIGC to improve the judicial interpretation, so as to make judicial practice more operable.

In addition to improving legislation, it is also necessary to establish litigation procedures for intellectual property rights in the field of AIGC, improve the standard and effectiveness of compensation for damages to relevant right holders, and actively use the diversified dispute resolution mechanism of big data under the network court to enhance the power and efficiency of judicial discretion. It also ensures the legal validity of AIGC's intellectual property rights, promotes the settlement of infringement disputes and maintains fair competition in the market.

4.4.2 We Will Build a Mechanism for Coordinated Governance Across Multiple Sectors of Society

The collaborative governance of all sectors of society includes the governance cooperation of different departments, enterprises, society and the public. The "Provisions on Ecological Governance of Network Information Content" mentions the idea of collaborative governance of internal subjects in the country, emphasizing the component of governance subjects. According to the current risk analysis of AIGC, it is necessary to work together with other departments.

In the collaborative governance of AIGC, first, the judicial organs need to promote the expert auxiliary witness system through special legal interpretations and regulations and legislation, so as to provide favorable support for judicial practice. In addition, in order to solve the problem of different architectures and data impassability caused by the lack of data interoperability mechanism of digital justice. The Opinions of the Supreme People's Court on the People's Courts Implementing the Spirit of the Fourth Plenary Session of the 19th Central Committee of the Party to Promote the modernization of the trial System and trial Capacity clearly lists "accelerating the construction of a unified judicial blockchain platform for the People's Courts" as an important link in the "deep integration of trial execution work and modern science and technology."[15]

Blockchain technology can be used to build a data flow system of information between the public security police system, the smart court and the digital information management platform of the procuratorate. And it is divided into three parts: basic service, platform management and interface service, respectively to ensure the consistency of judicial data, in line with the real needs of the law, and privacy, so as to realize the open source sharing of data, so as to facilitate multi-party cooperation in investigation and forensics, and improve judicial efficiency.

Second, the compulsory law capacity of government departments needs to ensure the stability, reliability and compliance of data, and strengthen the supervision of algorithm security. Companies work with governments to conduct risk assessments and to strengthen risk management by sourcing, collecting, balancing and source compliance of internal data. For medium-high risk AIGC applications, the government adopts the method of filing and publicity, strict monitoring, and whole-life cycle supervision, monitoring and tracking before and after the event, suspending the application operation at the first time when it infringes intellectual property rights, conducting post-event accountability, and disposing of infringing information in a timely manner.

Finally, when the public, as users of AIGC application, uses it to generate text, pictures and other content, and finds that there is infringement of intellectual property rights such as copyright, trade secret, unfair competition and monopoly, the public should timely give feedback to the relevant departments and jointly maintain the AIGC application market.

5 Conclusions

Science and technology is a double-edged sword. At present, with the increasing development of generative artificial intelligence technology, digitalization has brought convenient conditions and dividends to mankind, but it also poses new challenges to the traditional intellectual property legal system. Both the setting of preventing infringement in the operation of AIGC and the coping strategies in the face of infringement problems are insufficient to a certain extent. Therefore, it is urgent to improve the system governance system of "data source governance - generated content management - perfect forensics - building an integrated governance pattern", so as to promote the balance between AIGC development and intellectual property protection, and promote social development.

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