Research on New Mode of Digital Copyright Protection and Service Collaboration in China

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Abstract. This paper discusses the establishment of digital copyright complex ecological model under the background of digital economy, including the collaborative governance mode of multi-party co-governance of digital copyright ecology, digital copyright ecological identification system, value evaluation system, credit system. Thus, the theoretical basis of intellectual property protection and service mode jointly governed by the government, enterprises and the public is formed, and the digital copyright ecological mode jointly governed by multiple parties is formed.

Keywords: Digital rights · blockchain · IP valuation · credit management

1 Introduction

Due to the traditional administrative division of China's publishing industry, it is difficult to achieve coordination. With the development of the digital publishing industry and the basic completion of the comprehensive transformation and upgrading of Chinese publishing enterprises, the call for the construction of a new model of national digital copyright protection and service collaboration has become more and more popular. With the formation of digital copyright asset factor market and the development of new forms of digital copyright, it has become an urgent requirement for China's digital publishing industry to establish a new mode of digital copyright protection and service collaboration based on joint construction, sharing and co-governance.

2 The Current Situation and Trend Analysis About Digital Copyright Protection and Services in China

2.1 The Current Situation and Problems About Digital Copyright Protection and Services in China

The market size of China's online copyright industry in2020 has reached 1.184.73 billion yuan [1], the user payment scale is close to 565.92 billion yuan. It is not easy to make such achievements in the face of the global epidemic in 2020.

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Compared with the gratified achievements of China's network copyright industry, China's digital copyright protection and service model has been improved a lot, but it still falls far short of the actual needs of the industry and needs fundamental reform.

Under the traditional mode of copyright protection and service in China, the copyright ecology mainly adopts the mode of isolated management and fuzzy management. This results in the disconnection of copyright information and the confusion of ownership. The traditional copyright management system is centered on the copyright administration organization. In the era of digital economy, when solving the problem of copyright protection of digital products, it is faced with various inadaptability and incoordination. Copyright management has high cost and slow effect, and the copyright management is localized, thus forms the information islands. Local digital content platforms centrally manage digital products from a large number of copyright holders, and participate in the ecology as copyright organizations through the form of self-holding copyright. It has formed a multi-centralized copyright protection and service model with large-scale content platform as the core. However, each platform operates independently, and the essence of copyright protection and management is an enterprise behavior, so the rights of copyright owners are difficult to be effectively protected. At present, there are several islands of copyright protection and service platforms in the copyright ecology, which are composed of various copyright administrative agencies and various digital content platforms. Traditional copyright management takes works as the center, paper certificates as the carrier, and overall copyright rights as the starting point, which is not conducive to copyright protection and trading according to business needs. To confirm, authorize, use and safeguard the rights of works in fragments, segments, locations and conditions cannot meet the new development of the current digital publishing ecology.

2.2 Deficiencies in Digital Copyright Protection and Service Technology in China

At present, many digital publishing enterprises in China have begun to develop digital rights protection and service platforms based on blockchain. Blockchain technology mainly solves the problem of decentralized storage of digital copyright, however, in the process of dealing with the massive copyright data of copyright storage, right confirmation, transaction, use, monitoring and rights protection, it faces the expansion problem. Throughput bottlenecks limit its practical application, this is mainly reflected in the fact that each node in the system fully processes all transactions. Simply adding nodes does not improve the performance of the blockchain, but increases the consensus overhead [2].

Artificial intelligence technology is the basis of intellectual property intelligent services for digital products. However, with the continuous expansion of digital copyright under the background of digital economy, the copyright service environment becomes more and more complex. In the process of interacting with digital intellectual property rights, various kinds of data with different structure and mode will be generated. Due to the heterogeneity of cross-modal data, cross-modal knowledge cannot be modeled, processed and uniformly characterized by a single modal data analysis method. In recent years, the research of intelligent service based on unimodal data (such as text and image) is difficult to be applied.

Encrypted storage model and full-cycle protection model are two main data protection models in the current big data environment, however, the encrypted storage model

cannot guarantee the data protection of the whole network in the complex environment of big data, and cannot resist the collusion attack of malicious servers and malicious users. In addition, the theoretical framework of some related studies still has problems such as being unable to meet this condition in reality, single application or difficult to expand. Although the full-cycle protection model provides multi-mode protection for different security problems faced by different life cycle stages, the phase division of this model is not clear, and the multiple modes of data protection are not specific. In the aspect of originality detection, most of the current digital rights protection systems only carry out repetition check, which is not comprehensive [3].

2.3 Deficiencies in China's Digital Copyright Protection and Service Operation and Management Mechanism

Some publishing groups in China have built digital rights protection and service operation platforms. Under the background of digital economy and Internet economy, these platforms are faced with problems such as poor security, high operating cost, segmentation, and poor participation initiative of all parties, which are difficult to support the ecological construction of digital product copyright governed by multiple parties in the country. Most of these platforms follow the traditional copyright protection and service operation model, and realize a single business model. It fails to meet the needs of new business forms and new business models of digital publishing, and fails to cover the whole process of copyright protection and service of digital products.

At present, how to explore the new mode of digital copyright protection and service in combination with the actual situation of copyright management in China is a problem that China's publishing industry needs to think deeply about. For example, the China Copyright Protection Center has put forward the DCI system, but this kind of protection still focuses on the early stage of the whole copyright protection life cycle, and the process of transaction, monitoring and rights protection needs to be further strengthened. The Copyright Monitoring Center of the Copyright Association of China uses blockchain for certificate storage and carries out network monitoring, providing services such as copyright registration, copyright warning, copyright monitoring, infringement offline processing, electronic evidence collection, and litigation rights protection. However, the whole process of digital copyright transaction and circulation needs to be further improved.

3 The Main Content of Establishing the New Mode of Digital Copyright Protection and Service

Establishing a new model of digital copyright protection and service collaboration in China is a complex system engineering. It needs not only theoretical exploration, technological innovation and research and development, but also management innovation. These tasks mainly include digital copyright complex ecological model, digital copyright ecological cooperative governance model, digital copyright ecological identification system, digital copyright ecological value assessment system, and digital copyright ecological credit management system in the background of digital economy.

In terms of theoretical research, it is necessary to use complex system theory, combined with sociology, law, economics, management, communication (network analysis) and other theories to build an ecological model of intellectual property protection and service of digital products, by comparing the differences and application scope of the three governance mechanisms (government-led, market-led and self-organized).An ecological governance mode based on new technologies, new business models and new copyright forms for intellectual property protection and service of digital products has been constructed, and a life-cycle operation mode for digital products of various forms has been established.

In order to realize digital copyright protection and service management, the first prerequisite is to give each digital product a unique "identity identifier" according to business needs, that is, to develop a unique digital copyright ecological identifier. This identifier can not only be compatible with traditional publication identifiers, but also be applicable to the fragmented and life-cycle copyright ecological environment of digital products under the new model based on blockchain technology.

Economic efficiency is a key consideration for any digital rights protection and service business platform. To achieve this goal, on the one hand, system optimization theory and tools should be used to optimize the design of the whole network platform, on the other hand, the IP value of typical digital products should be evaluated. The latter is the basis of digital product copyright trade, and its evaluation effect directly affects the sustainable and healthy development of digital copyright trade.

The copyright protection of digital products and the health of digital content have aroused great concern of the society. How to protect the copyright rights and interests of authors without affecting the reasonable use of users? How to ensure the quality and health of content while also taking into account the freedom of speech of netizens? These are questions that need to be discussed in depth.

From the experience of world Internet management, the use of intellectual property credit management is a relatively effective way for many countries. To achieve this goal, on the one hand, the state should formulate the corresponding laws and regulations, establish the corresponding collaborative management mechanism, to ensure that the credit management can be effectively implemented; On the other hand, it is necessary to build a national credit management information system so that the credit management data of various industries can be shared [4].

3.1 Digital Copyright Ecological Unique Parsing System

At present, many identifiers have been formulated in the publishing industry. There are International Standard Book Number (ISBN), International Standard Serial Number (ISSN), and International Standard Serial Number (ISRC) Recording Code, ISTC (International Standard Text Code), ISWC (International Standard Musical Work Code), ISMN (International) Standard Music Number, International Standard Audiovisual Number (ISAN), and International Standard Link (ISLI) Identifier), ISNI (International Standard Name Identifier), etc. These different identifiers are used in specific domains.

In the Internet environment, in order to uniquely identify Digital objects, a DOI (Digital Object Unique Identifier) is created and a mature parsing system is developed.

However, DOI is mainly applied to the management of general digital products in a centralized management mode.

Besides DOI, There are also a variety of unique identification systems such as DID (Decentralized Identifier), GS1, OID (Object Identifier), Ecode (Entity Code), CID (Communication Identifier) and so on. Among them, DID is the most valuable reference for the decentralized management of digital copyright ecological identifiers. DID is a new type of identifier, which first appeared in the Internet Identity Workshop (IIW) in 2015.It is autonomous and controllable, permanent, and encrypted and resolvable, and can be used in multiple scenarios such as digital identity, digital asset management, and government affairs.

The main task of digital copyright ecosystem unique identifier system is to develop its resolution system. Digital copyright identification resolution system is an important part of the copyright industry network system and a nerve hub supporting the interconnection of digital copyright industry. The digital copyright industry should carry out the deployment and application exploration of the first and second level nodes, and actively seize the opportunities of information technology and digital copyright development.

The digital copyright identification resolution system consists of identification code, identification carrier, identification resolution system, identification data service and other parts.

Identifier Code An identity symbol that uniquely identifies a digital copyright and its structural information, similar to a digital publication "ID card". The identity code is usually stored in the identity carrier, including active identity carrier and passive identity carrier.

Identification parsing system, a system that can query the network location or relevant information of digital copyright resources according to the identification code, conducts unique logical positioning and information query of digital copyright resources. It is the premise and foundation for the precise connection between the global copyright supply chain system and the enterprise publishing system, the whole life cycle management and intelligent service of digital publications.

Identification data service can carry out copyright identification data management and cross-enterprise, cross-industry, cross-region and cross-country data sharing with the help of identification coding resources and identification parsing system.

3.2 Digital Product Copyright Credit Management System

On May 30, 2016, "The State Council on Establishing and Improving the Joint Incentive and Punishment System for Trust-Breaking to Accelerate the Construction of social Integrity" had been issued. Many industries have established their own joint incentive and punishment mechanism for trust-breaking. On January 6, 2016, the former Ministry of Culture issued the Measures for the Administration of Blacklist in Cultural Markets (Trial).On October 16, 2019, the State Intellectual Property Office issued the Administrative Measures on the List of Joint Disciplinary Targets for Trust-Breaking in the Patent Field (Trial). Since 2011, the National Copyright Administration has cooperated with the Cyberspace Administration of China, the Ministry of Industry and Information Technology, the Ministry of Public Security and other departments to carry out copyright supervision of key websites, and set up a supervision and early warning mechanism for

key works. At present, China's digital copyright credit management mechanism has not been established.

In order to establish a more perfect digital copyright credit management mechanism, the author believes that the following aspects should be done well.

First, we will strengthen the construction of digital copyright credit regulations and standards. This includes the measures for the management of the list of joint disciplinary targets for trust-breaking in the copyright field, the Regulations on the management of copyright credit information, and the regulations on the management of copyright credit investigation and so on. Under the guidance of the National Technical Committee for Standardization of Social Credit and other standards organizations, digital copyright credit related standards will be formulated [5].

Second, accelerate the construction of digital copyright credit information sharing system, and realize seamless connection between copyright credit information and national credit information system.

Third, we will develop a copyright credit catalogue system. With reference to the principles and methods of compiling national credit information catalogs, a credit catalog database of copyright industry should be established. For the network content platform, micro works copyright protection credit points can be introduced, and the corresponding credit score database can be established according to the infringement information reported by netizens.

3.3 IP Value Evaluation System for Digital Products

IP is abbreviation for "Intellectual Property". in particular, high value Copyrights. High value copyright, in a narrow sense, refers to the copyright with high economic value; Broadly speaking, it refers to the copyright with high potential market value or high strategic value. Due to the influence of objective or subjective factors, some high value Copyrights do not reflect high economic value. Therefore, the broad sense of high value copyright includes the narrow sense of high value copyright. The digital products with copyright value in the market are very large, but the digital products with high copyright value account for a small number, generally less than 20%.

The IP value assessment of digital products is divided into two types: one is the assessment of the relative value of copyright. In order to screen digital products, digital products are sorted according to the value of copyright. The other is for the reference of copyright transaction, to evaluate the absolute value of copyright, that is, to determine the actual value of digital products.

The relative value of IP for digital products is relatively simple. On many web authoring platforms, various rankings are often published by evaluating the relative value of IP of digital products. These rankings provide a guide for readers to choose works, provide a reference for investors to choose investment objects, and promote the enthusiasm of authors to create.

The evaluation of IP absolute value of digital products is complicated. In terms of evaluation methods, there are traditional methods such as method, market method, income method, and some improved methods such as Monte Carlo method, call option method and so on.

Table 1. Evaluation indicators of the economic value of online literature

Level 1 indicators	Level 2 indicators	Level 3 indicators
Brand construction	profile	Media mentions
		Positive and negative comments from the media
		Media mention quality
		Channel covering
	reputation	User satisfaction
		Academic attention
		Social recognition
	active	The number of users
		User interaction
		User activity
Market operation	Author bargaining power	Author image value
		Author traffic value
	Development potential	List exposure frequency/quantity

The evaluation index of IP absolute value of digital products involves different dimensions and multi-level indicators. There are usually technical value, legal value, market value, strategic value, economic value and so on. The value of each dimension is usually divided into three levels. Table 1 is the author's evaluation index of IP value of network literature from the dimension of economic value.

In terms of evaluation methods, some index factors are scored by experts because it is difficult to quantify or collect data, and some index factors are scored by computer. The latter mostly uses the linear regression analysis method to determine the weight of each index. At present, more and more artificial intelligence methods are applied, which makes the accuracy of evaluation higher and higher. The former also has some more mature methods. For example, the Analytic Hierarchy Process (AHP) method.

4 Conclusion

In order to solve the copyright protection and service problems in China's copyright industry, it is necessary to study the new mode of digital copyright protection and service collaboration in China, and to improve and enrich this mode through continuous experiments [6].

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Authors' Contributions. Based on the current situation of China's copyright industry, this paper has three innovative points in the construction of a new mode of digital copyright protection and service collaboration in China: Firstly, the construction framework of digital copyright ecological unique identifier system is proposed. The second is to compile some evaluation standards of IP value of digital publications, and the third is to give the construction ideas of digital copyright credit management system.

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