

The Development of Intellectual Property Protection in the Digital Age

Feng Xue

College of Humanities and Law, Henan University of Animal Husbandry & Economy, Zhengzhou, 450044, China

Keywords: Digital age; intellectual property; protection

Abstract: This greatly enriches and develops the methods of collection, processing, storage and transmission in the digital age, and provides practical technical support and guarantee for the library's document resources sharing. With the development of digital technology, works such as writing, art, photography, music, animation, film and television can be stored by digital technology. Transmission by digital transmission technology can have binary digital coding expression, and can realize mutual conversion between original form and digital form by digital technology. At the same time, it also brings new conflicts of interest to the current intellectual property system, especially the copyright system. The measures taken by the administrative organs to safeguard the legitimate interests of the intellectual property right holders are self-help relief measures for the right holders, which can better reflect the initiative of the right holders and also conform to the characteristics of intellectual property rights as private rights. In view of the fact that the technical measures for the protection of intellectual property rights of digital works are also illegally infringed, this paper systematically reviews the laws and regulations for the protection of technical measures at home and abroad. This paper discusses the relationship between the digital age and the protection of intellectual property rights, and discusses how to develop the protection of intellectual property rights in the future on the basis of the digital age.

1. Introduction

In today's world, information digitization technology and network communication technology with computer technology as the core have developed rapidly and have been fully applied to the library field [1]. This has greatly enriched and developed the ways of collecting, processing, storing and transmitting literature resources, and provided practical technical support and guarantee for the library's literature resources sharing [2]. In the era of digital information, the digitization of intellectual property rights has gradually become a trend, followed by the generation of intellectual property rights and the criminal means of infringing intellectual property rights have become more scientific and diversified. With the development of digital technology, beautiful works such as text, art, photography, music, animation, film and television can all be stored through digital technology [3]. All the data transmission can be expressed in binary digital coding and can be transformed from the original form to the digital form by digital technology [4]. The impact of digital works on many traditional characteristics of intellectual property makes the protection of intellectual property rights of digital works increasingly prominent [5]. The digital age requires that we must develop and implement new and effective law enforcement measures to ensure respect for intellectual property and the integrity of the intellectual property system.

In 2018, General Secretary Xi Jinping pointed out at the Boao Forum for Asia that intellectual property protection is an important part of the property rights protection system, and it is necessary to give full play to the deterrent effect of law [6]. At the same time, it also brings new conflicts of interest to the current intellectual property system, especially the copyright system [7]. In practice, the current criminal law is difficult to deal with the complex and diverse crimes of infringing intellectual property rights in the digital age [8]. The measures taken by administrative agencies to safeguard the legitimate rights and interests of intellectual property rights holders are self-rescue measures for the rights holders, which can not only reflect the initiative of the right holders, but also conform to the characteristics of intellectual property rights as private rights [8]. This kind of

document resource sharing based on computer network communication technology breaks the restriction of region and space, and provides great convenience for readers to visit and enjoy the document resources [9]. In view of the fact that the technical measures for the protection of intellectual property rights of digital works are also illegally infringed, this paper systematically reviews the laws and regulations for the protection of technical measures at home and abroad [10]. Finally, the application of technical measures for intellectual property protection of digital works is analyzed in detail from the two fields of public welfare information service industry and profit-making information service industry.

2. Issues Facing the Protection of Intellectual Property Rights of Digital Works

2.1. The copyright issue of digital works

With the emergence of digital technology and the continuous emergence of new forms of digital works, we have been able to form a basic consensus that the development of digital technology makes it more difficult to protect the intellectual property rights of digital works. In the social environment where the network supported by digital technology has been quite popular, access to. After a work is digitized and used in a digitized way, it is only a change in the carrier form and means of use of the work, and no new work is produced. The construction of government informatization should be combined with the transformation of government functions to improve the efficiency and management level. In order to promote the openness of government affairs and the construction of a clean and honest government, it is necessary to apply information technology to the problems that the masses are most concerned about, and enhance the transparency and fairness of handling affairs for the people. Compared with traditional intellectual property rights, it belongs to new non-material objects, such as integrated circuit layout design rights, technical measures, genetic technology, electronic database, domain name and source code. Taking technical measures as an example, it is a technical protection measure for the formed intellectual property rights, which can be encryption technology or electronic signature, etc. its purpose is to prevent unauthorized unrestricted dissemination. Technical measures have been widely used, thus changing from simple technical means to independent rights and interests.

2.2. Protection of the content of digital works

In the aspect of legal protection, one of the basic principles of copyright law is to protect only the expression forms of works, but not the contents and ideas contained in works. The resource pooling network service refers to the network service provider acting as the regional resource sink. The role of the central set is different from channel network services. The resource pooling network service provider needs to collect the resources actively in advance, and the demand side can download the relevant resources stored by them through searching. In digital library, encryption algorithm is often used to ensure the most basic security of digital works. As shown in Figure 1.

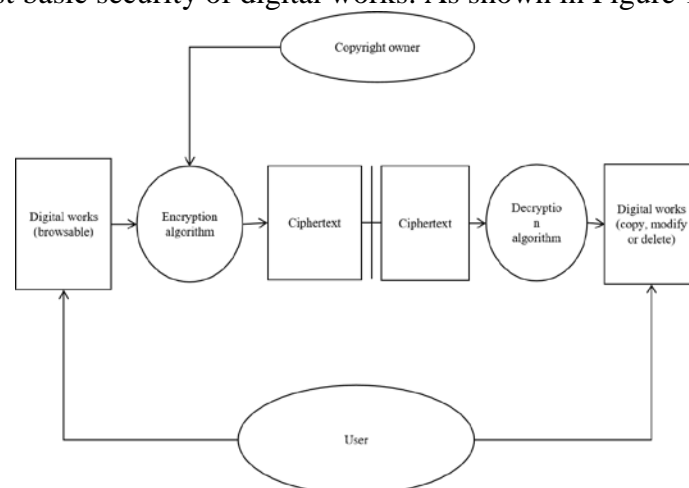


Figure 1 Encryption diagram of digital works

With the development of network technology and digital technology, most libraries in China have realized the networking of document information management, and online retrieval has become a major means of resource sharing in modern libraries. Although it should be considered that the regulation of infringement of intellectual property rights cannot rely excessively on criminal law legislation, it must be acknowledged that criminal law legislation is indispensable for filling some loopholes. From a technical point of view, no copy is produced during the linking process, so it cannot be considered that it infringes the copy right of the linked party. The chained object is not played in the normal chain, and the chain setter is not liable for infringement. If someone copies all the contents of a work, rearranges or reorganizes it, and then makes computer software with the same technical ideas or databases with the same data and information contents, it may not infringe the copyright of the original work, but when the information in the work involves other people's trade secrets, it is improper use, and the right holder can invoke the anti-unfair competition law to obtain relief.

3. Technical Measures for the Protection of Intellectual Property Rights of Digital Works

3.1. Authentication technology

Authentication technology is a kind of computer security technology which has been widely used before the emergence of digital works. It is mainly used to prevent intruders who fake the identity of legitimate users from illegally invading the computer system. The Internet enables people to enter the treasure house of innovative raw materials containing information and knowledge in an instant. There are many differences between the existence of works in digital space and that in analog space. In the simulated environment, infringement requires certain investment (equipment, factory, workers, etc.), and it is easy and effective to stop infringement. In the digital environment, it is difficult to identify the author. As for linking, whether linking infringes the copyright owner's broadcasting rights depends on the way of linking. Intellectual property rights, also known as intellectual property rights, belong to intangible property in the civil legal system. Therefore, its core is the income generated from the possession and use of the intangible assets. The legal interest corresponding to the protection of criminal law is property ownership. At present, biometric technology mainly uses fingerprint, voiceprint, iris, retina, face and palmprint to identify. as shown in picture 2.

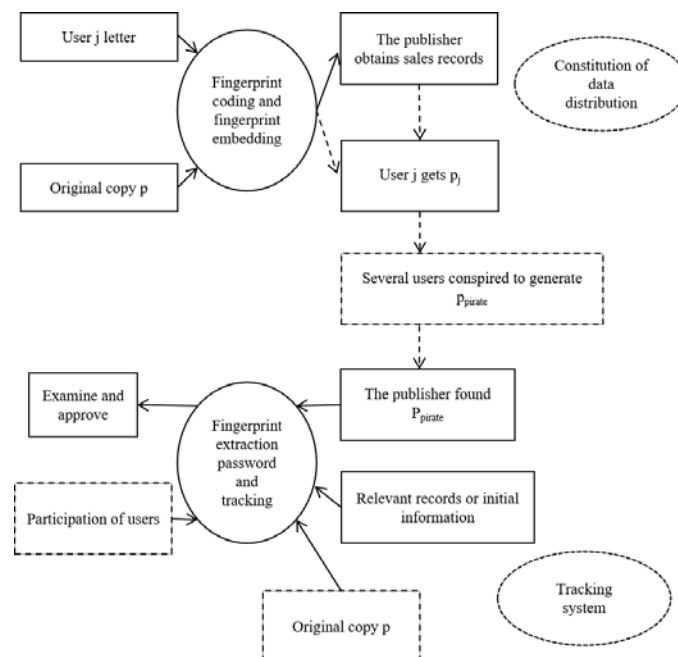


Figure 2 A simple model of the digital fingerprint system

However, users of embedded chain are invisible, and setting embedded chain is suspected of playing linked objects publicly, which is likely to violate the playing right of linked objects.

3.2. Encryption technology

Information encryption technology is an effective means to protect digital works under the network environment, and it is an active information security precaution. Because both encryption and decryption parties use the same key, the key distribution must be completed before sending and receiving data. Therefore, the distribution of keys becomes the weakest and therefore the risk in the encryption system. The biggest link. In practice, if the digital works owner wants to encrypt the digital works, he needs to generate a pair of his own key pair. The public key in the key pair is public, but the private key is kept by the owner of the key. The actual process of file encryption and decryption by the sender and receiver. As shown in Figure 3.

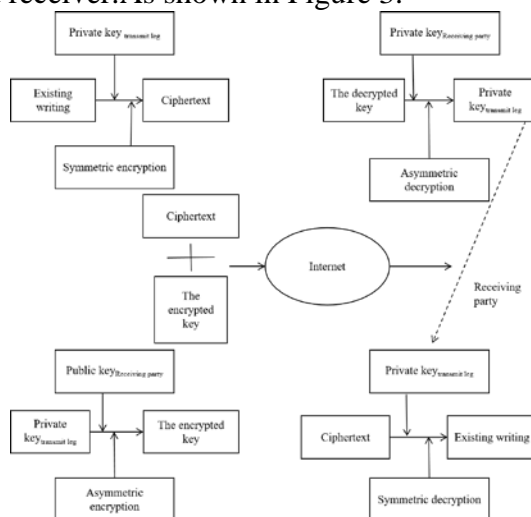


Fig. 3 Encryption process combining symmetric encryption and asymmetric encryption

The traditional reason for emphasizing private ownership is to ensure self life and self responsibility through private ownership, thus allowing individuals to act freely. However, this kind of unilateral statement made by the editorial department is obviously unfair to the authors of vulnerable groups. Information infrastructure requires huge investment, but free riding is also very easy. The Internet has no national boundaries and is accessible from almost anywhere in the world. Communication via the Internet is bringing people closer together. On the last question, the World Intellectual Property Organization intends to publish a report on the intellectual property needs of holders of traditional knowledge based on extensive research activities conducted by fact-finding missions. Because each information exchange generates a unique key, there is no need to maintain the key and worry about the leakage or expiration of the key during the transmission of digital works.

4. Conclusions

The use of technical measures to protect the intellectual property rights of digital works is actually a double protection of digital works, that is, the protection of technical measures and the legal protection arising from the protection of technical measures. In the digital age, the new behaviors and types of intellectual property infringement are likely beyond the scope of the criminal law legislators at that time. It is good at solving technical problems, attracting a large number of computer talents, and constantly improving the search service, hoping to provide us with more comprehensive, richer and more accurate Chinese information. However, the intellectual property protection of digital works is a problem. A long way to go. In order to solve the problem of intellectual property infringement of digital works, it is necessary to deeply study how to combine technical measures with legal protection measures, so as to realize the intellectual property protection of digital works. In legislation, we should perfect the criminal legislation of intellectual property crimes in China and realize "equal behavior and equal protection". We should raise the incriminating standard of intellectual property crimes appropriately, and consider the social

harmfulness of behavior comprehensively when sentencing. At the same time, we should further improve the criminal responsibility of network service providers. Therefore, in-depth study of these issues is of great practical significance for the protection of intellectual property rights of digital works.

References

- [1] Xiaoya Fu. Challenges and Responses to the Protection of Intellectual Property Criminal Law in the Digital Age. *Contemporary Law*, no. 2, pp. 67-74, 2020.
- [2] Zuo Xiaochuan, Zou Zhenfei. Analysis of Intellectual Property Management of Information Service and Knowledge Service. *Technology and Market*, vol. 24, no. 008, pp. 303-307, 2017.
- [3] Luo Zichao. Research on the Problems and Countermeasures of Book Publishing in the Digital Age. *Journalism and Communication*, vol. 000, no. 003, pp. 58-59, 2018.
- [4] Tong Yuxia. Technology Innovation and Copyright Extensive Collective Management System in the Digital Age. *Legal System and Society*, vol. 08, no. 273, pp. 57-58, 2017.
- [5] He Cultivation, Lin Ying. On the "right to be forgotten" of personal information in the digital age. *Modern Intelligence*, vol. 036, no. 012, pp. 24-29, 2016.
- [6] Li Guoquan. The Mechanism of Criminal Law Protection of Copyright in the Digital Era——Also on the paradigm evolution from response to prevention. *Electronic Intellectual Property*, vol. 341, no. 04, pp. 98-105, 2020.
- [7] Cheng Miaomiao. Analysis of personal data leakage in the digital age. *Science and Technology Communication*, no. 1, pp. 97-99, 2018.
- [8] Yuan Feng, Chai Hua, Xie Yimin. Performance-based design of building structures towards the digital age. *Architectural Journal*, no. 11, pp. 9-16, 2017.
- [9] Wang Yuying. New changes in photographic art in the digital age: taking creative and viewing methods as an example. *China National Expo*, no. 4, pp. 236-237, 2020.
- [10] Mary K. Swinger, Translated by Deng Siyuan. The manipulated brain in the digital age. *Chinese and Foreign Book Digest*, no. 5, pp. 63-65, 2019.