Discussion on Legal Model of Intellectual Property of Computer Software

Kewen Hou¹, Meili Zhang²*
Nanchang Vocational University, Nanchang, Jiangxi, 330004, China
*Corresponding author’s e-mail: qgjxzbt@163.com

Abstract: With the development of computer software and information technology, software industry has become one of the important engines of modern economic construction and structural transformation in China. However, because the computer software is very complex and the industry value is high, it is easy to lead to the flood of intellectual property infringement, which is undoubtedly a great blow to the researchers in the field of computer technology and related industries. Therefore, through analyzing the current situation of intellectual property protection of computer software, this paper fully discusses the comprehensive construction mode of copyright law, patent law and trade secret protection law, in order to ensure the innovation and application environment of this intellectual property right.

1. Introduction
With the development of computer technology, the economic structure of our country has undergone profound changes, among which computer software plays a great role. Since the 1950s, the world's first computer software has emerged. Because computer software and hardware equipment play an important role in the construction of various industries, people begin to pay attention to the supporting intellectual property protection system. In the 1980s, various countries began to formulate appropriate software legal protection system according to their own economic development characteristics. Therefore, with the continuous innovation of computer software technology, its supporting intellectual property protection system has gone through different historical stages.

2. Connotation Analysis of Computer Software

2.1. Concept of computer software
Users can communicate through computer software and smart devices such as desktop computers, mobile phones, laptops, etc. In this process, computer software can process specific data structures according to user instructions or sets of programs. Computer software usually includes application software and system software. Applications are usually developed according to specific needs or user needs, such as WeChat, QQ and other types of entertainment, office APP. System software refers to individual operating systems, patches, drivers, etc., such as Windows, UNIX. System software can be divided into operating system, database system, language system and various service programs. The purpose of system software development is to serve each independent hardware device.

Another confusing concept is computer programs. Compared with computer software, the concept of computer program is more abstract, it contains target program and source program. The target program is a collection of binary machine codes composed of 0 and 1, and its operation depends on the smooth solution of function calls. Source programs are functional and readable text files that are
written through advanced language specifications. The source program can only translate the target program in the form of computer language through a special translation program[1].

2.2. Features of computer software
Software development has been decades of history, different stages of software development process and commercial applications are also different. Because software has different characteristics from other legal protection objects, it is relatively difficult to study its intellectual property protection model. In this paper, the characteristics of computer software are summarized as follows:

Table 1. Characteristics of computer software.

|   | Characteristics                                      |
|---|------------------------------------------------------|
| 1 | Intangible and attached to tangible objects          |
|   | The essence of software is abstract data and logical operation, which is invisible; Software can not operate independently, need to use tangible carrier. |
| 2 | High design cost, strong replicability               |
|   | Software development is a huge system engineering with high development cost; Can easily lead to illegal reproduction and abuse |
| 3 | Short life cycle                                     |
|   | Computer software updates and obsolescence are fast  |
| 4 | Functional and creative                              |
|   | Can effectively solve practical problems, functional; Computer software exists in the form of documents, which is easy for people to read and browse. |

3. Legal Protection Model of Intellectual Property Rights in Computer Software

3.1. Analysis of necessity

3.1.1. Compliance with legal protection requirements.
Because every computer software is the creation and effort of researchers, it is innovative, special and independent. Unlike other legal objects, computer software uses a series of data and language programs to express the design of researchers. The development of software can not be separated from the conception, research and language filling of researchers. Before it is formally put into use, it also needs countless repeated experiments and debugging. It abstracts the intellectual activities in real life and social environment, forms executable research results, and then uses computer language to express the research results logically, and finally forms a set of mature application software. Therefore, the intellectual property of computer software conforms to the protection of property rights of works, and the necessary legal guarantee system should be established[2].

3.1.2. Software infringement or piracy will endanger the legitimate rights and interests of researchers.
The sharing of information and data under the background of the network makes the dissemination of computer software without time and geographical restrictions, which provides the possibility for software infringement and piracy. Unlike authentic software, pirated software has low technology content, so the cost of citation and development is relatively low. Because pirated software can basically meet the needs of ordinary users, the application prospect is very broad. The research and development of a genuine software has condensed the sincere cooperation and countless efforts of the R & D team. Once its painstaking development and design of the software is pirated and sold wantonly by unscrupulous vendors, the innovation and R & D spirit of R & D personnel will inevitably be hit. If the law does not have an appropriate safeguard mechanism, the enthusiasm of each R & D team and even the orderly development of the whole computer software industry will be seriously hindered.

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3.2. Main models of legal protection
There are three main models of legal protection:

3.2.1. Copyright protection
Because computer software is a developer's creative product, it is necessary to protect the copyright of related programs and documents. Developers use a set of digital code and computer language to express computer programs, and then copy them to the computer for users to disseminate and download. Therefore, it is necessary to use copyright to protect computer software. Once the software is developed, its copyright should be generated as naturally as other new products. Because the protection mode of copyright is effective at any time, the function and function of legal protection is greater, and software protection is more easily supported by law. After decades of development, China has initially formed a legal guarantee system in computer software, which is mainly copyright law, supplemented by patent law and trade secret law. In order to connect with the international intellectual property protection system and improve the international recognition of domestic software, copyright law is regarded as the main means of software protection in China[3].

3.2.2. Patent Protection
The purpose of software development is to replace labor with information technology and finally realize the function of information management. Because copyright law can only protect the development of software, but it can not effectively protect the software operation method, it is necessary to use patent right method to protect its operation method, development process and concept expression. By abstracting the control means, the computer software integrates all kinds of data structures digitally, and finally realizes the production demand efficiently, which fully accords with the protection characteristics of patent right.

Although Chinese researchers have begun to pay attention to the patentability of software, so far, our legislature has not brought software into the scope of patent protection law. The Patent Review Guide, which was implemented in 2006, provides a strict definition of the invention of computer software, while it also shows examples of computer programs applying for invention patents[4]. Thus, China is still conservative about the patent protection of computer software.

3.2.3. Protection of trade secrets
Information has become an important strategic resource in a society of rapid information dissemination, resource sharing and increasing aggregation. Computer software contains rich management and technical information, its commercial value can be imagined, so it is necessary to
strengthen the protection of software trade secrets. Trade secret protection has good confidentiality, which can protect the core content, program and method of computer software, so as to protect the core interests and competitiveness of researchers and developers. However, the protection itself is flawed, it depends on the confidentiality of the software itself, once the software is leaked or disclosed, it can not be protected by the trade secret protection law. This requires R & D personnel or developers to invest a lot of human and material resources to keep the software confidential. However, pirates and other technicians can decrypt the software by reverse traceability and source code cracking, so the confidentiality of the software itself is not as high as expected.

4. Construction of Legal Model of Intellectual Property of Computer Software

4.1. Software Copyright Protection Mode

4.1.1. Proprietary software
The copyright protection of proprietary software refers to the protection of its related documents. Because the source code of the software is not publicly displayed, thus the relevant documents of proprietary software belong to unpublished works from the perspective of copyright. The author of the relevant document should have his personal right, but because the relevant document has not entered the market, the author can not obtain the property right. From a professional point of view, whether software copyright infringement can be considered from two aspects: substantive similarity and contact. "Material similarity" refers to the existence of works in the market that are substantially similar to proprietary software documents. "Contact" refers to whether the relevant documents of the software are published publicly, and if not, there is no substantive contact, then other groups or individuals can express the similarity of the software and obtain independent copyright.

4.1.2. Public software.
It refers to the disclosure of source code to the community related documents, original. When software related documents enter the market with computer programs, no other unit, group or individual can modify, copy, disseminate or distribute them at will, because the software documents have acquired independent copyright. Since source code disclosure can easily lead to copyright infringement, why should researchers disclose it? This is because open software and source code can meet the reading and document learning needs of most industries, units, groups and even individuals in society, and can further reduce the cost of software re-development, which is conducive to the development of computer and software development technology. In order to effectively protect the copyright of open software from infringement, the state should formulate the corresponding safeguard system from the angle of litigation procedure, punishment strength and benefit balance[5].

4.2. Software Patent Protection Mode
The construction of software patent protection mode should also be considered from the two dimensions of proprietary software and public software. Through research and analysis, this paper holds that software patent protection should be effectively constructed through the following three ways.

- Perfect part clause: the state should clarify the validity and legality of software patent protection from the legal level.
- Set strict patent authorization standard: according to the existing patent law, invention patent should have practicability, creativity and novelty. Novelty refers to the software is not a prior art and there are no other conflicting applications within the market.
- Shortening the review period: in order to get commercial profits as soon as possible, developers will put software on the market before applying for software patents. This kind of profit method is not desirable, but it is also influenced by factors such as "difficult patent application" and "too long examination period" and so on. Because soft development is a long
time-consuming, but the technology is eliminated quickly, regardless of the time spent by technicians in the early research and development, patent review alone may take two to three years. Therefore, in order to protect software patents more effectively, relevant management departments should actively simplify the review process and shorten the review period.

4.3. Software Trade Secrets Law Protection Model

Trade secret infringement usually requires the following conditions:

- The object of existence is trade secret.
- There are improper means in tort.
- The result of infringement brings certain economic loss to the direct person of power.

In practice, the court will determine whether there is infringement according to the two principles of similarity and contact. However, because the Internet has broken the limitations of traditional time and region, many seemingly inaccessible documents can be stolen by high-tech means, which requires courts and relevant enforcement personnel to take into account various factors. Adhere to the principle of fairness and justice, the parties to the case to make a fair decision[6]. At the same time, the relevant legal system of trade secret protection should also take full account of practical factors, constantly revise and perfect, so as to make the legal system of trade secret protection more applicable and sound.

5. Conclusion

As an intangible asset, computer software is not as intuitive and manageable as hardware equipment, but it plays an important auxiliary role in the effective play of various hardware equipment functions. With the increasingly severe competition in the economic market, software development and innovation is the driving force to maintain high quality development in computer and related fields. Therefore, in order to ensure the technical enthusiasm of software R & D personnel and standardize the software development and application market, both the state and law enforcement departments should constantly explore more effective and sound legal security models and systems from the perspective of software intellectual property rights.

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