Research on Intellectual Property Information Service Framework of University Library under the Background of New Era

Jianjun Yuan, Yazhu Gu

School of Economics and Management, Shanghai Maritime University, Shanghai, 201306, China

Abstract

[Purpose/Significance] In-depth study of intellectual property information service system of university library under the background of innovation-driven development, strategic development of intellectual property power and "double first-class" construction, construction of framework model and corresponding development suggestions, in order to make some contributions to the construction of university library and scientific research and teaching work. [Methods/Process] By means of literature investigation and CNKI database retrieval, this paper studies the general situation of intellectual property information service in university libraries at present, constructs the system framework model of intellectual property information service, and puts forward corresponding suggestions for future development. [Result/ Conclusion] According to the research on intellectual property information service framework of university libraries in the new era, it is proposed that university libraries should strengthen innovation and intellectual property education publicity and promotion, strengthen Multi-party cooperation to promote learning and communication among alliances, establish and train High-quality and innovative intellectual property talents, and improve intellectual property information service system and rules and regulations.

Keywords

1. Introduction

With the development of knowledge economy and the continuous acceleration of economic integration, intellectual property has become an important strategic resource for an industry or even a country to build its core competitiveness.Intellectual property is a measure of a country's economic development level and an important index of science and technology innovation ability, intellectual property information service and strong support of intellectual property work, make the effective utilization of information resources of intellectual property rights, high value cultivate and promote the transformation of intellectual property rights of intellectual property rights have become the key role of the construction of the library.

The national "double first-class" construction and the all-round development of innovation-driven strategy have ushered in new development opportunities for higher education, and at the same time, they have given new responsibilities and tasks to university libraries, whose service content has been continuously extended and expanded, and the library has gradually changed from a service-oriented institution to an academic institution. As the main force of scientific and technological innovation and intellectual property creation, and as an important institution of intellectual property information service, universities have abundant literature database resources and human resources, and have the conditions to carry out intellectual

property information service. Several Opinions of the State Council on Accelerating the Construction of a Powerful Country with Intellectual Property Rights under the New Situation put forward "increasing the number of intellectual property information service outlets and improving the public service network of intellectual property information" [1], and the National Intellectual Property Protection and Application Plan of the 13th Five-Year Plan (Guo Fa [2016] No.86) requires "increasing the number of intellectual property information service outlets. Strengthen the intellectual property information service capacity building of public libraries, university libraries, scientific and technological information service institutions, industry organizations, etc. "[2], and the" 13 th Five-Year Plan for the Development of National Education "(Guo Fa [2017] No.4) clearly stated that" support university libraries to build intellectual property information service centers to provide services for promoting university innovation "[3]. The publication of this series of policy documents undoubtedly brings timely development opportunities for the service transformation of university libraries and the development of intellectual property information services.

According to the data released by the State Intellectual Property Office, although the number of intellectual property rights has increased greatly since the implementation of the Outline of the National Intellectual Property Strategy for ten years, the number of applications for invention patents and trademark registration has ranked first in the world for many years. However, the characteristics of intellectual property rights in China are still very obvious,Because the intellectual property information service work in Chinese universities is still in the initial exploration stage, the service is single, the deep technical service consciousness and ability are weak, and the lack of uniform service standards and service system that can make the intellectual property patent information service in university libraries develop in a large scale are still the main reasons that hinder the development of patent information service. Therefore, based on the "double first-class" construction strategy, the requirements driven by the national innovation strategy and the surge of intellectual property demand, it has become an important topic for Chinese university libraries to study the intellectual property information service framework system in depth.

2. Research Progress of Intellectual Property Information Services in University Libraries at Home and Abroad

2.1. The Development Status of Intellectual Property Information Services in American Libraries

The United States Patent and Trademark Office (USPTO) has established PTRC (Patent and Trademark Resource Center) in 84 libraries across the country,Its main job is to publicize patent information and provide related intellectual property information services to enterprises and the public.

USPTO owns American patent documents, trademark documents, trademark retrieval tools, patents and related news publications, etc,It also contains resources such as the public version of the examiner retrieval system including PubEAST and Pubwest. Provide website self-service inquiry system, intellectual property consultation, intellectual property training and courses, characteristic database and other value-added services.

2.2. The Development Status of Intellectual Property Information Services in European Libraries

The European Patent Office (EPO) cooperates with the patent offices of EU member States to establish 318 patent information centers in national patent offices and universities, and 26% of universities are the organizers of patent information centers. The European Patent Institute under the European Patent Office cooperates with the patent offices of member countries to

jointly carry out and promote intellectual property education in the whole school. Links to online and offline training courses, activities, materials and publications that are particularly relevant to intellectual property topics can be found in universities, research centers and TTO.

EPO has patent data resource set, EP-A, EP-B full text and DOCDB patent documents provided by the European patent office for patent information. Provide training and courses related to intellectual property rights, intellectual property consulting and value-added services, of which value-added services mainly refer to the commercialization of intellectual property rights.

2.3. Research Progress of Intellectual Property Information Services in Libraries of China

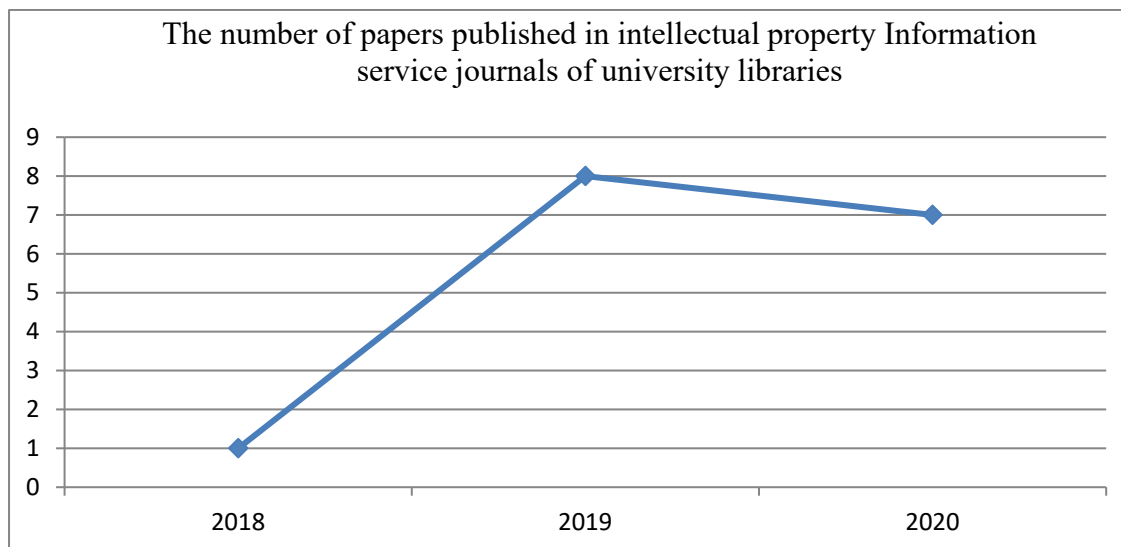### 2.3.1. Overview of Research on Intellectual Property Information Services of Libraries in China

In this paper, CNKI is used for advanced retrieval. With "universities" as the theme and "intellectual property rights" as the key words, the papers published before December 31, 2019 are searched, and 1204 academic papers are retrieved, including 1055 academic journals, 7 doctoral papers, 79 master's papers, 9 conferences, 3 books and 5 achievements. Taking "University Library" as the theme and "Intellectual Property" as the key word, the paper published before December 31, 2019 was searched, and 155 academic papers, 4 master's papers, 1 conference, 4 characteristic journals and the rest were academic journals were retrieved. After screening, we mainly analyze and study academic journals, and finally get 146 academic journal papers. Through the analysis of 146 academic journals, it is found that the academic journal papers on intellectual property of university libraries were first published in 1998. After more than ten years of development, the intellectual property research of university libraries has made some breakthroughs. Now, the publishing time of 146 academic journals is divided according to a five-year interval, and two papers before 2000 are excluded, and their distribution is shown in Table 1.

Table 1. Number of intellectual property papers published in university libraries

Years	2000-2004	2005-2009	2010-2014	2015-2019
Total number of articles published	22	31	54	37

It can be seen from the table that there are relatively few researches on intellectual property rights in university libraries in China, with 22 articles from 2000 to 2004, and an increase from 2005 to 2009 compared with the previous five years. However, from 2010 to 2014, the number of studies on intellectual property rights of university libraries has advanced by leaps and bounds, and the total number of published journals is the largest, which indicates that more and more scholars have begun to pay attention to the research on intellectual property rights of university libraries.

Taking "university library" as the main body and "intellectual property information service" as the key word, the author searched the academic papers before October 31, 2020, and found 15 academic journals and 1 master's thesis. Starting from 2018, most of them are published in 2020, and their distribution is shown in Figure 1.

Figure 1. Number of academic papers published on intellectual property information service in university libraries

Since China is a country with a relatively late establishment of intellectual property system in the world, the academic research on intellectual property started relatively late, and the research on intellectual property information services of university libraries is even less, which is the value and significance of this study. In recent years, with the attention paid by the relevant state departments to intellectual property rights, the development of intellectual property information services in university libraries is just in time. In 2018, only one academic paper was published, but in 2019, the research on intellectual property information services of university libraries began to advance by leaps and bounds. The number of published papers was eight times that of 2018, and it still maintained a relatively high level in 2020. In the future, intellectual property information service will still be the research focus of university library information service.

2.3.2. The Development Status of Intellectual Property Information Services in Libraries in China

In order to implement the national innovation-driven development strategy and build a strong country with intellectual property rights, the State Intellectual Property Office and the Ministry of Education have continuously improved the intellectual property information service network of universities by encouraging universities to set up intellectual property information service centers, join the Technology and Innovation Support Center (TISC) and national intellectual property information public service outlets.

The intellectual property information service in colleges and universities in China started late, and the domestic research mainly focused on the current situation and mode of patent information service and intellectual property information service. In the aspect of patent information service, Shen Jinhua et al,[4,5] showed that the patent information service of university libraries in China is in the preliminary exploration stage, and considered and explored the trend of patent information service of university libraries and constructed the ability and quality framework of patent information service of university librarians facing the needs,Wang Junling et al,[6] studied the current situation of patent information service in colleges and universities, and explored the path of supporting scientific research management; Zhang Shanjie et al,[7,8] studied the components and promotion paths of the competitiveness of patent information service in university libraries, and constructed the framework of intellectual property information service capacity building of university libraries with user participation. In the aspect of intellectual property information service, Zhang Chi [9] studied

the cooperation mode and content of information service from both inside and outside schools. He believes that Multi-party cooperation is an effective way to carry out services; Du Juanjuan et al,[10] studied the present situation of intellectual property information service and put forward corresponding countermeasures in view of the difficulties it faces. She believes that changing the orientation of scientific research evaluation, improving the utilization rate of information resources and building a standard system of intellectual property information services are effective strategies for transforming resources into innovative outputs; Wang Liping et al,[11] researched and designed the training system of intellectual property information service in colleges and universities.

Through literature retrieval and consulting, the author found that the existing scholars' research mainly focused on the preliminary exploration of the content and mode of a certain service of intellectual property information service, but did not carry out in-depth exploration and research on the system and practical application of intellectual property information service. Although the intellectual property information service of university libraries has ushered in opportunities, the research and practice in the service system are lacking, and the construction of intellectual property information service system needs to be improved urgently.

3. Characteristics of Intellectual Property Information Services in University Libraries

In the Regulations on Intellectual Property Management in Colleges and Universities issued and implemented in 2017, it is defined that intellectual property rights in colleges and universities are the rights enjoyed by natural persons or legal persons according to law for the achievements created by their intellectual activities, mainly including patent rights, trademark rights, copyrights, layout-design rights of integrated circuits, geographical indication rights, new varieties of plants, and exclusive rights of undisclosed information, etc.

Intellectual property information service refers to a kind of information service which is specialized around the development and utilization of intellectual property information resources. Its main services include basic services such as patent retrieval, patent publicity and training, patent consultation and patent document transmission, technical services such as patent analysis, patent novelty search, patent mining, patent navigation, patent layout, patent early warning, patent transfer and transformation, patent competitive intelligence analysis and other intellectual property information services. Compared with other information services, intellectual property information services have the characteristics of synergy, whole process and interactivity.

3.1. Synergy

Synergy of intellectual property information service means that the service staff team of intellectual property in colleges and universities should cooperate with their service users, and the service team should actively participate in the whole process of users' scientific research activities or commercial activities, and users should participate in intellectual property information service.

3.2. The Whole Process

The whole process of intellectual property information service means that the whole life cycle of the service needs the participation and support of intellectual property information service, and it needs to provide the whole process of intellectual property information service.

3.3. Interactivity

Interactive intellectual property information service means that the service is user-centered and encourages users to participate in the construction of intellectual property information

service. In terms of service mode, it emphasizes the interactive space between users and subject librarians, and sets up an interactive platform with interactive functions. Enhance the interactivity of intellectual property information services and provide personalized services for users.

4. Business Types of Intellectual Property Information Services in Colleges and Universities
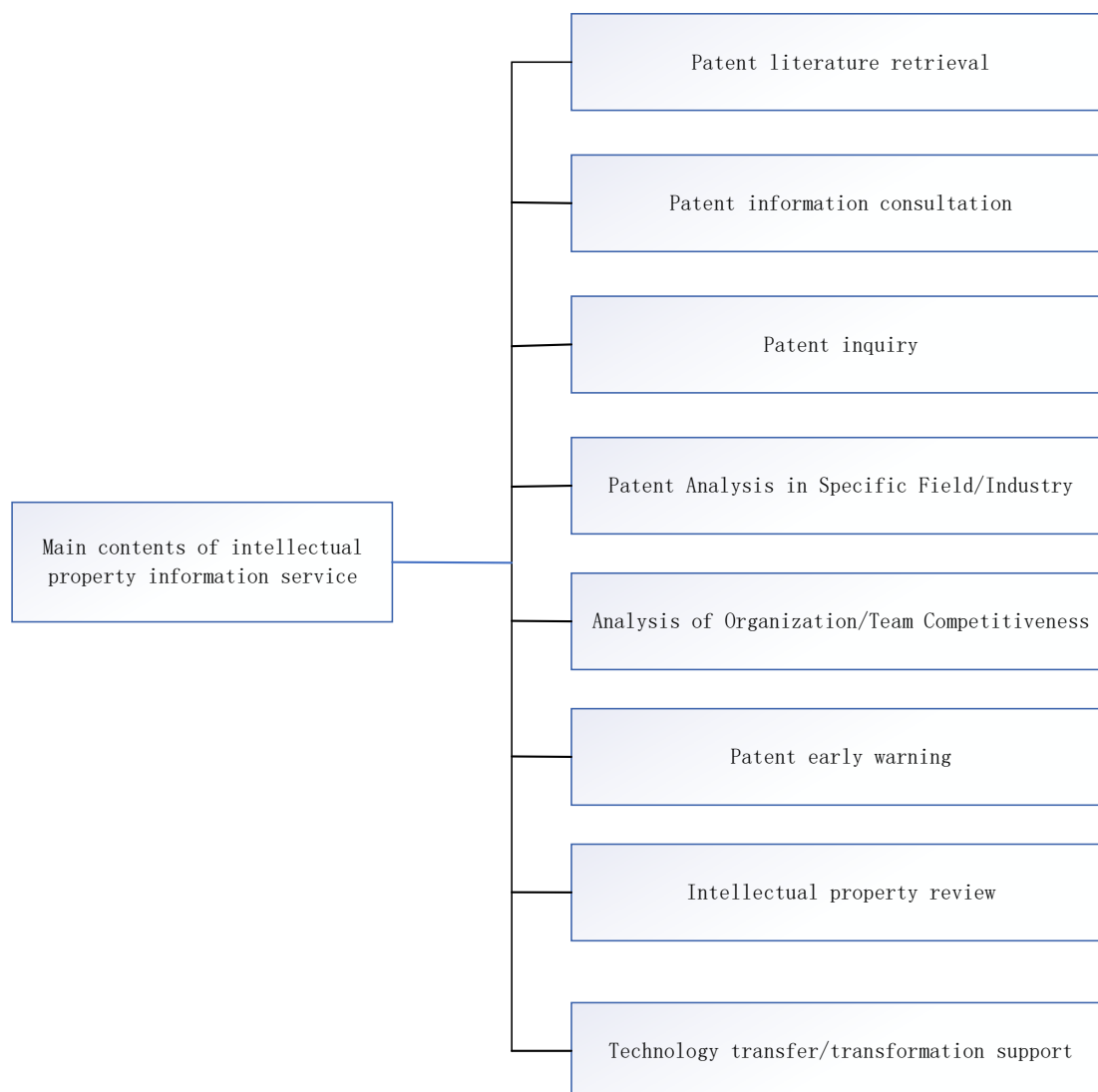
At present, intellectual property information services of university libraries in China mainly focus on patent information services, focusing on providing comprehensive information services, covering the whole process of creation, application, protection and management of intellectual property rights, supporting the construction of school characteristic disciplines and collaborative innovation, and promoting the transformation and application of scientific and technological achievements. Moreover, universities with intellectual property information service centers can give full play to their social service functions and provide relevant intellectual property information services for enterprises and institutions in characteristic industries and local economic and industrial development. Through the literature investigation, this paper makes a further statistical analysis on the types of intellectual property information services carried out by university libraries, and finds that the types of intellectual property information services carried out by university libraries are slightly different. But basically it can be divided into two levels: basic service and deep service. Basic services include patent retrieval, patent novelty search, patent consultation and patent information training. Patent information retrieval industry includes specific technology patent retrieval, similar patent retrieval, patent legal status retrieval, patent information retrieval and patent citation information retrieval, etc. Patent information training business includes basic knowledge of patent, patent application process, patent database utilization, patent information analysis and other aspects of training; Patent novelty search includes patent application novelty search and patent infringement novelty search. In-depth services cover patent analysis (patent early warning analysis, patent competition situation analysis, patent infringement analysis and patent value evaluation), patent navigation, patent agency, patent strategic layout, intellectual property analysis and evaluation, etc. The main contents of intellectual property information service in colleges and universities are shown in Figure 2.

4.1. Patent Literature Retrieval

Patent literature retrieval mainly refers to the retrieval and transmission of patent texts for specified patent literature information or technical topics according to the needs of clients. Its clients include enterprises, universities, research institutions and government departments.

4.2. Patent Information Consultation

Patent information consultation mainly provides consulting services on patent application matters, patent information consultation of the same family, patent legal status information and so on according to the needs of clients. Its service forms are mainly mail and telephone.

Figure 2. Main business types of intellectual property information service in colleges and universities

4.3. Patent Novelty Search

Patent novelty search refers to novelty search service according to the needs of clients in patent application and patent infringement prevention. Its service targets include enterprises, universities, research institutions and government departments, and the service forms are mail and telephone.

4.4. Analysis of Patents in Specific Fields/Industries

Specific field/industry patent analysis refers to analyzing and processing the technical and legal information in patent documents for a certain technical subject or technical field/industry, and providing competitive intelligence and decision-making reference for the client project of science and technology.

4.5. Analysis of the Competitiveness of Institutions/Teams

The analysis of institutional/team competitiveness mainly focuses on the evaluation and positioning analysis of innovation competitiveness of designated institutions and R&D teams in a certain field according to the needs of clients participating in market competition.

4.6. Patent Early Warning

Patent early warning refers to the dynamic tracking and early warning of the patent situation of the client's designated patent or designated technical field, establishing an early warning mechanism, warning risks in advance and preventing infringement.

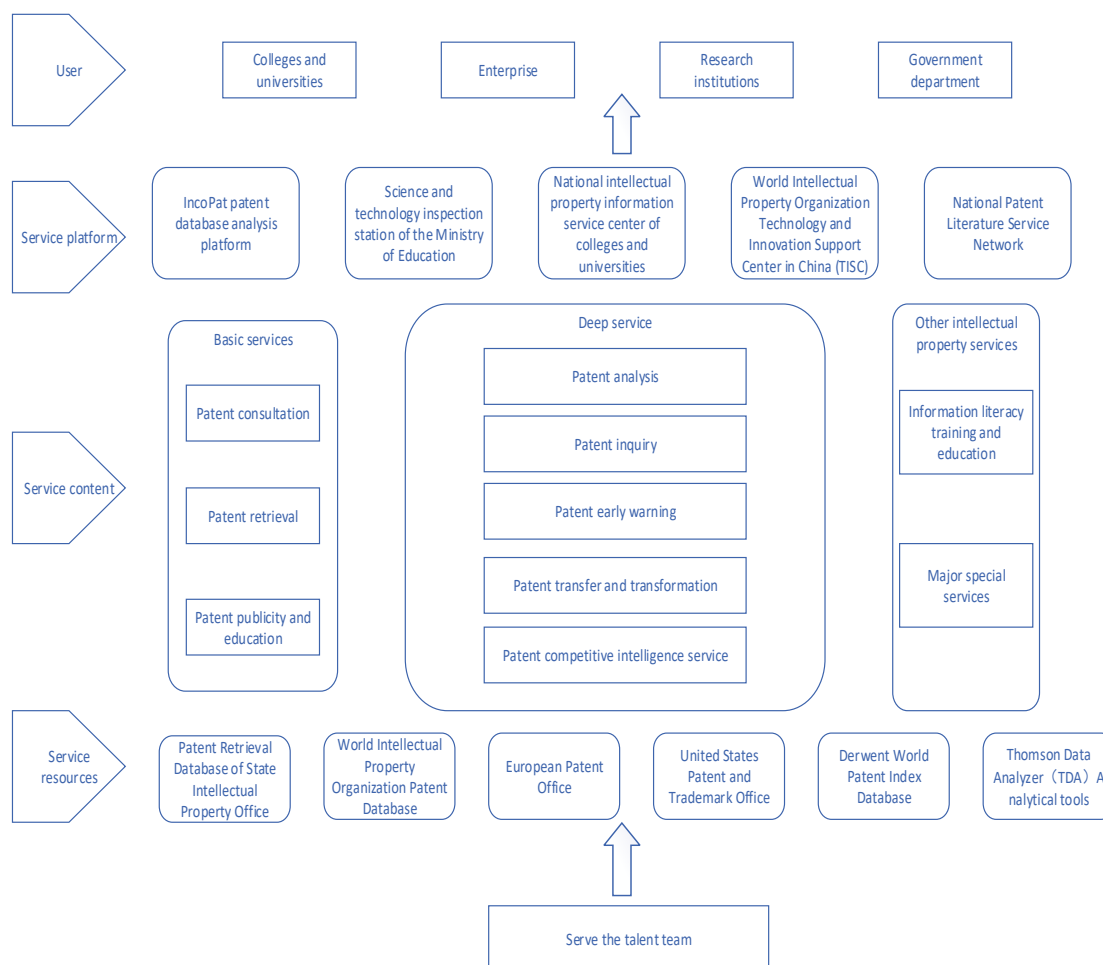## 4.7. Intellectual Property Appraisal

Intellectual property appraisal refers to the infringement risk diagnosis, innovation enlightenment analysis and patent value evaluation of intellectual property rights involved in economic and technological activities, which provides strong support for economic and technological decision-making.

4.8. Technology Transfer/Transformation Support

Technology transfer/transformation support mainly evaluates the value, technical stability and market prospect of scientific and technological achievements, excavates potential transfer/transformation objects, provides search and analysis reports, etc., and helps the transfer / transformation of scientific and technological achievements.

5. University Library Intellectual Property Information Service System Framework

Through the above theoretical and case studies, this paper constructs the framework model of intellectual property information service system of university library, as shown in Figure 3.

Figure 3. Framework model of intellectual property information service system in university library

Based on the librarian service team, the system framework establishes contact with users through three core parts: service resources, service content and service platform, and provides users with diversified and personalized intellectual property information services.

6. Suggestions on the Future Development of Intellectual Property Information Services in University Libraries

6.1. Increase the Publicity and Promotion of Innovation and Intellectual Property Education

The 18 th National Congress of the Communist Party of China clearly stated that "scientific and technological innovation is the strategic support for improving social productivity and comprehensive national strength, and must be placed at the core of the overall development of the country. "It is emphasized that we should adhere to the road of independent innovation with Chinese characteristics and implement the strategy of innovation-driven development. As the main force of scientific and technological innovation and intellectual property creation, colleges and universities must do a good job in educating and publicizing students' scientific and technological innovation and intellectual property. Based on the needs of "double first-class" construction and library construction, as well as the emergence and wide application of financial media, university libraries should seize opportunities and attach great importance to the promotion and development of intellectual property information services. Actively push relevant content to users, let more people know or use the service, make full use of big data technology and financial media in the new era, and provide users with more diversified and accurate services.

6.2. Strengthen Multi-party Cooperation and Promote Learning and Communication among Alliances

On the whole, intellectual property information service is still in its infancy, and intellectual property information service centers are mostly affiliated with university libraries. By cooperating and innovating with other universities, enterprises, scientific research institutions and government departments, the construction of intellectual property information service system can be accelerated. On June 22, 2018, the "Seminar on the Construction of University Intellectual Property Information Service Center" co-sponsored by Tongji University Library, Peking University Library, Tsinghua University Library and Shanghai Jiaotong University Library was held at the Sino-French Center of Tongji University. The alliance of intellectual property information service centers in colleges and universities was formally established, which marked that intellectual property information service in colleges and universities entered a new chapter. In November, the national "2018 Annual Meeting and the First Academic Seminar of University Intellectual Property Information Service Center Alliance" was held in the library of Shanghai Jiaotong University. With the help of the annual meeting of the alliance, it promoted the learning and communication among intellectual property service centers in universities and improved their professional service capabilities. In addition to exchanges and cooperation with universities, the center should also strengthen cooperation with local enterprises, scientific research institutions and government departments.

Universities should carry out extensive cooperation and collaborative innovation, and break down service barriers to promote their own development. Internally, it can cooperate with administrative departments, colleges, projects or project teams, and externally, it can cooperate with government departments, scientific research institutions and local enterprises. Through cooperation, we can gain experience and opportunities, realize the complementary advantages of resources, and enhance the level and ability of intellectual property information services.

6.3. Establish and Train High-quality and Innovative Intellectual Property Talents

At present, due to the lack of attention of senior leaders, the awareness of intellectual property information service personnel in China is insufficient, and due to the professionalism of patent information service, the academic background, professional knowledge and skills of intellectual property information service personnel are extremely demanding. Therefore, it is particularly important to establish and cultivate a High-quality intellectual property information service talent team. The library should first advocate the establishment of intellectual property related subject education to schools, train professional talents with subject knowledge, and provide High-quality talents for intellectual property information services from the source. Then, it provides targeted lectures and course training for the existing intellectual property information service personnel, so as to continuously improve the professional skills and experience of the service personnel and provide better intellectual property information services. Finally, the introduction of high-level, high-level and High-quality intellectual property information service cutting-edge talents from outside can accelerate the construction of intellectual property information service through communication and learning with service personnel in the library.

6.4. Improve the Intellectual Property Information Service System and Rules and Regulations

With the promulgation and implementation of intellectual property policies of government departments and the establishment of intellectual property information service center, intellectual property information service has become an important direction of university library transformation. Perfect system and rules and regulations are the guarantee of providing efficient and High-quality services,Especially in the current "double first-class" construction, university leaders pay more and more attention to intellectual property education and management, and actively give support to personnel and funds. On the one hand, university libraries should strictly abide by relevant policies and regulations, implement relevant national laws and regulations, and take advantage of policies and local advantages to actively carry out intellectual property information services. On the other hand, we should improve the management organization mechanism and management rules and regulations, establish and improve the intellectual property management system, clarify the post responsibilities, establish a long-term incentive and training mechanism, strengthen internal and external exchanges, and form a unified service standard and system as soon as possible, so as to make the intellectual property information service work more standardized.

7. Conclusion

Intellectual property is an important index to measure innovation ability and scientific research level, and intellectual property information service has become the direction of service transformation of university libraries and the development trend of deep information service of university libraries. The Measures for the Implementation of the Construction of Intellectual Property Information Service Center in University Map has a certain understanding of the construction requirements of intellectual property information service center in universities through data investigation, and has formed a construction framework and preliminary scheme. It requires university libraries to establish intellectual property information service centers in universities according to their own characteristics, further improve the public service network and system framework of intellectual property information, and enhance the innovation and scientific research capabilities of universities to support the national innovation-driven development strategy and the "double first-class" construction of universities.

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