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Scientific and technological achievements - intelligent management platform of intellectual property in universities

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Abstract: As many platforms on the market are of different quality, it is difficult to ensure the security of intellectual property rights, while many university campus websites lack the embedding of intellectual property management platform, which is not conducive to the transformation of scientific and technological achievements of intellectual property rights in universities. In the "Outline for the Construction of a Strong Intellectual Property State (2021 - 2035)"[1], it is clearly pointed out that the construction of a strong intellectual property state should be promoted in an integrated manner, the level of intellectual property creation, application, protection, management and service should be improved comprehensively, and the important role of intellectual property system in the construction of socialist modernization should be given full play. It is divided into three major sections: patent, trademark and copyright, to realize intelligent and safe management of customers, and at the same time provide professional IPR application services, laws and regulations publicity, application documents information, etc., which helps to accelerate the transformation of achievements of universities and enterprises. The purpose is to promote the transformation of scientific and technological achievements of universities, and it can also be applied to enterprises to maintain, manage and protect the intellectual property rights of rights holders for universities and enterprises [2]. In the future, the database of the platform can be expanded for deep learning-based IPR management to promote the integration of Internet application, management, transaction, and maintenance of IPR.

Keywords: Intellectual property; Management platform; Transformation of scientific and technological achievements.

1. Introduction

The current IP market is large, with 80% of enterprises and universities' ongoing IP demand [3], all increasing the pressure on IP management, mainly because of the rising number of IPs year by year, which provides a very substantial market for our platform, and with the strong support of national policies, the market share can reach ten billion per year.

Intellectual property is an important part of scientific research achievements of universities and the lifeline of scientific and technological innovation of universities. Combining with the current situation and problems of intellectual property management in universities, we adopt the lightweight and easy care and expansion SSM framework to develop the intellectual property management system in universities, realize the Informa ionization and standardization of intellectual property management in "Several Opinions on Accelerating the Construction of Intellectual Property Information Public Service System under the New Situation" [4], strengthen the coordinated management of information, and further promote the overall regulation of intellectual property industrialization in universities. The purpose of strengthening intellectual property management is to improve the ability to apply intellectual property and to improve the national economic growth from the knowledge level and technology level. The level of IPR management restricts the full play of IPR application ability. As the level of innovation employment increases, a good IP management system can show the innovative strength and its efficiency and rigor. It helps universities to protect intellectual property while responding to the national call for innovation culture and strengthening intellectual property protection.

The design pattern of this system is SpringMVC, which separates the control layer, service layer and data logic layer to achieve high cohesion and low coupling. Semi-automatic mapping with MyBatis to improve the efficiency of data manipulation. MySQL database is used to realize the basic operation of the backend database.

The system provides a convenient and fast management service platform for the backend administrator, so that the administrator and patent applications do not have to print documents, fill out forms, queue up to apply for registration of trademarks, disputes over IPR infringement, statistics on the number of patent applications, and a series of tedious and complicated problems with many loopholes. The system requires the administrator to input the patent name of the application to check and check whether there is infringement in the statistics. Then the trademark registration, patent information entry, after the later queue audit, through the successful application for patents. The administrator can view the user information and add, delete, check and change the user information. The patent applied by the user needs to be submitted to the background, and the administrator reviews the information to see whether there is a trademark, the patent name has been registered, and whether the patented invention is infringing. The traditional form information management, patent fee settlement and a series of complicated audit process can be liberated. Based on the specific number of years that the customer has applied to use the patent, we calculate and require the customer to pay for the use of the patent for the corresponding number of years. Only after the expiration of the usage period of the patent, the administrator can empty the patent fees from the order information of the customer. The main structure of the system is divided into eight parts

including user management, rotation management, announcement management, application management, transfer conversion management, type management, fee management, and system management.

2. Industry background market analysis

2.1. Domestic general environment trend

With the advent of the knowledge-based economy, the acceleration of the integration of the world economy, market competition is becoming increasingly fierce. The protection of intellectual property rights is mentioned to a new historical height, especially after joining the WTO, China's enterprises face the impact of foreign enterprises, how to maintain the original domestic market, to develop the international market has become a difficult problem faced by enterprises, and the protection of intellectual property rights is one of the key links. The ability and level of protection of intellectual property rights will affect the level of China's economic development.

The main features of China's IPR development are: the improvement of IPR legal norms has started a proactive strategic design; IPR management has become more scientific; IPR protection has become more rationalized; the public's awareness of IPR has improved significantly; IPR culture has gradually integrated with traditional Chinese culture; and IPR has grown in both quantity and quality at the same time.

a. The rule of law of intellectual property has been improved and the enforcement system of intellectual property has been improved

In terms of IPR protection, China has established a dual-track system of judicial protection and administrative enforcement. China's Patent Law, the

Trademark Law and other laws have provisions on administrative handling of intellectual property disputes under the jurisdiction of the relevant administrative organs, which are complementary to judicial protection of intellectual property and at the same time independent of judicial protection, forming a "dual-track" model of intellectual property protection.

b. The ability to create and apply intellectual property rights has improved significantly

With the improvement of intellectual property awareness, some high-tech enterprises with core competitiveness based on independent innovation have emerged in China. The strategy of creating famous brands has been implemented in large and medium-sized enterprises, and there are some small enterprises which are good at using intellectual property rights to fight for a big success.

small enterprises that are good at using intellectual property rights to fight for big profits.

c. Gradual formation of intellectual property culture

In recent years, the culture of traditional Chinese intellectuals has changed considerably from the arrogance of "stealing books is not considered stealing" to the calculating of royalties; and Chinese enterprises have started to move from the passive state of being suppressed by intellectual property rights to the active use of intellectual property rights for legitimate interests. The market economy has provided the internal impetus for the change in cultural environment.

2.2. Enterprises with a need for intellectual property rights

Take patents as an example. Patented products can first of all exclude competitors from imitating and copying, and increase the market share of patented products in the relevant product market. Defense for enterprises, on the one hand, to protect their products from infringement, and on the other hand, to prevent their products from infringing on the rights of others. Like a shield, intellectual property rights can effectively prevent other enterprises from spearing. Increase the intangible assets of enterprises Enterprise assets include not only visible and tangible tangible assets, but also invisible and intangible assets. The value of intangible assets is often much greater than the value of tangible assets, such as a patent with high technical content, a reputable trademark, the market value it contains is immeasurable. Intellectual property is the proof of an enterprise's innovation capability One simple way to understand an enterprise's innovation capability is to know the amount of intellectual property owned by the enterprise. IP ownership is a strong indicator of a company's ability to innovate, which can be used to gain customer trust and build a company's brand. In addition, intellectual property rights can bring many benefits to a company, such as licensing fees for the use of intellectual property rights, intangible advertising effects, applications for government projects, and government funding support.

In the era of knowledge-based economy, intellectual property becomes an important asset and the core competitiveness of an enterprise or even a country. Our government attaches great importance to intellectual property rights, and the National Intellectual Property Strategy Outline was issued in 2008, and various local governments have actively introduced various relevant policies to protect intellectual property rights and stimulate the development of intellectual property rights. The annual number of trademark and patent applications in China is the highest in the world, which shows that enterprises in China have attached great importance to IPR from the number of applications. There are countless enterprises in need of intellectual property rights.

2.3. External Market Environment Analysis

The business in the field of intellectual property services includes patent agency business, trademark agency business, agent for geographical indication trademark registration application business, intellectual property litigation and other legal services, among which patent agency and trademark agency business is the main business. At present, there are many enterprises in the field of intellectual property services in China, and the market pattern is relatively fragmented, and the main representative enterprises are August Gourd, Beijing IP, and Standard World, etc.

With the in-depth promotion of the "administrative and service" reform and the continuous optimization of the business environment, the number of China's intellectual property service institutions continues to grow. By the end of 2020, the number of institutions engaged in intellectual property services in China will be about 73,000, an increase of 9.3% compared with 2019.

In terms of regional distribution, the eastern region has the largest number of IP service institutions, accounting for about 66.8%, while the central region, western region and northeastern region account for 14.8%, 14.5% and 3.8% respectively.

3. Intellectual Property Management Platform

Intellectual property rights are an important part of scientific research achievements of universities and the lifeline of scientific and technological innovation of universities. Combining with the current situation and problems of intellectual property management in universities, the SSM framework, which is lightweight and easy to protect and expand, is adopted to develop university intellectual property management system, realize the Informa ionization and standardization of intellectual property management, strengthen the coordination and management of information, and further promote the overall regulation of intellectual property industrialization in universities. The purpose of strengthening intellectual property management is to improve the ability to apply intellectual property and to improve the national economic growth from the knowledge level and technology level. The level of IPR management restricts the full play of IPR application ability. As the level of innovation employment increases, a good IP management system can show the innovative strength and its efficiency and rigor. It helps universities to protect intellectual property while responding to the national call for innovation culture and strengthening intellectual property protection.

3.1. Platform Function Overview

The design pattern of this system is SpringMVC, which separates the control layer, service layer and data logic layer to achieve high cohesion and low coupling. MyBatis is used for semi-automatic mapping to improve the efficiency of data operation. Using MySQL database to achieve the basic operation of the backend database. The system realizes the functions of background login, password modification, user management, enterprise management, trademark copyright inquiry, patent management, customer relationship management, term inquiry, audit management, patent fee settlement, and infringement management.

3.2. Development Environment and Technology Introduction of the System

3.2.1. My Eclipse programming software

Myeclipse it is an eclipse-based program development language IDE. it is mainly used to support Java and J2EE. myeclipse is very powerful and widely supported, especially for open source products. It can automate and develop and release java ee for program databases and web servers, as well as the entire application database and development services. it has a feature-rich integrated development environment that includes complete coding, debugging, testing, and publishing capabilities [1].

3.2.2. Tomcat server

Tomcat is a servlet container developed by Apache. It supports servlets and JSPs and provides some special web server features such as Tomcat control platform, secure domain management and Tomcat valves. It can be used to respond to requests for access to HTML pages when the apahce server is configured on the computer [3].

Tomcat software directory structure and functions:

bin: service-related scripts, e.g., start, shutdown, etc.

conf: stores different configuration files, such as server.xml and web.xml

lib: library files required for tomcat to run

logs: running log files

webapps: the root directory of web deployment

work: store the class files after jsp compilation

3.2.3. MyBatis

MyBatis is an excellent persistence framework tool that bridges the gap between JSP objects and relational databases through object-relational mapping, coordinates the interaction between objects and databases, provides data query and recovery mechanisms, and achieves separation from the underlying database [5].

The functional architecture of Mybatis is divided into three layers:

(1) API interface layer: interface APIs provided for external use, and developers manipulate the database through these native APIs. The interface layer invokes the data processing layer to complete specific data processing as soon as it receives a call request.

(2) Data processing layer: responsible for specific SQL lookup, SQL parsing, SQL execution and execution result mapping processing. Its main purpose is to complete a database operation according to the invoked request.

(3) Basic support layer: responsible for the most basic functional support, including connection management, transaction management, configuration loading and cache processing, which are all common things, and extract them as the most basic components. It provides the most basic support for the upper layer of data processing layer.

3.3. Platform Function Analysis

The system software provides a convenient and fast management service platform for the backend administrator, so that the administrator and the patent application do not need to print documents, fill in forms, queue up to apply for registration of trademarks, disputes over IPR infringement, statistics on the number of patent applications, and a series of tedious and complicated ways with many loopholes. The system requires the administrator to input the patent name of the application to check and check whether there is infringement in the statistics. Then the trademark registration, patent information entry, after the later queue audit, through the successful application for patents. The administrator can view the user information and add, delete, check and change the user information. The patent applied by the user needs to be submitted to the background, and the administrator reviews the information to see whether there is a trademark, the patent name has been registered, and whether the patented invention is infringing. The traditional form information management, patent fee settlement and a series of complicated audit process can be liberated. Based on the specific number of years that the customer has applied to use the patent, we calculate and require the customer to pay for the use of the patent for the corresponding number of years. Only after the expiration of the patent term, the administrator can empty the patent fee from the order information of the customer.

The main structure of the system is divided into eight parts including user management, rotation management, announcement management, application management, transfer and transformation management, type management, fee management and system management.

3.4. Platform Function Realization

(1) When entering the login interface of the system, administrators are required to input their account number and password as well as the corresponding verification code

generated, and then they can log in to the main interface of the backend management system after the verification is successful, and users will be prompted to re-enter the correct information to log in again after the verification fails.

(2) After the front desk administrator information is successfully verified, it will enter the menu interface of this management system, which will be refreshed and displayed in the function menu bar of the system. Results transfer click on the patent, you can proceed to add key information such as patent title, content, amount, contract attachment, date, user name, etc.

(3) Patents that have been approved need to be settled by the administrator, and then the customer needs to pay for the use of the patent according to the number of years and months of use of the patent. The administrator clicks the fee settlement on the bottom left of the patent that has not been settled to jump.

(4) Patent details page, mainly including filing fee, annual fee, conversion fee, and patent name.

4. Concluding remarks

This team has built this IP management system to promote the transformation of scientific and technological achievements in universities, to maintain intellectual property rights for universities, and to manage and protect the intellectual property rights of the right holders. The challenges encountered in the process not only made the team members more determined, but also benefited everyone. In view of the deepening awareness of domestic IP management, increasing management needs and rising innovation level, we believe that a good IP management system can demonstrate innovative strength and its efficiency and rigor, and we expect to help universities to protect IP, strengthen the awareness of IP protection and contribute to the development of national innovation culture.

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