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In the field of computer software, the technical solutions are generally abstract methods, so they have certain particularities in patent mining compared with other technical solutions. This article mainly discusses the patent mining based on enterprise R&D projects from the perspective of patent agents in the field of computer software.

Discussion on Patent Mining in Computer Software

In recent years, scientific and technological innovation has enabled us to make great strides in the new era. At the same time, the government's strong support and pushing forward the protection of intellectual property rights have added impetus to the development of science and technology. Being an important element of intellectual property rights, patent is one of the main tools to lay out the protection barrier for scientific and technological innovation achievements. In the process of preparing patent protection barriers for the innovation achievements, patent mining plays an indispensable role.

The so-called patent mining is to analyze, sort, split, screen and reasonably speculate on the complicated technical achievements from the perspective of patent in the process of scientific research or production, and then to obtain various technological innovations and patentable technical solutions. In practice, patent excavation is mainly carried out by patent agents, R&D personnel and enterprise patent engineers.

In this article, the author will talk about the patent mining in the field of computer software based on his own practice and experience in daily work, from the perspective of the patent agent, and provide it to everyone for discussion and criticism.

The method of patent mining

In practice, the main objects provided patent mining service by most of the patent agents in computer soft field are Internet companies. For Internet companies, a research and development project is usually carried out because of the need to develop a computer software product. In the process of project R&D, it needs to solve a large number of technical problems. Therefore, project R&D is the area with the highest density of innovation points in the daily activities of Internet companies, and should be regarded as the key target of patent mining.

The patent mining, based on Internet enterprise R&D projects, is generally the work of decomposing and screening for R&D projects that are being developed or completed by Internet companies. Specifically, by analyzing, screening, and expanding new results in R&D projects with an aim of maximizing profits, the patent results that have been or may be generated in the R&D project will be excavated.

In the actual operation of patent mining for R&D projects of Internet companies, it is generally necessary to focus on three steps: understanding the technical products in the R&D project, constructing the technical framework in the technical products, and mining the technological innovations in the technical framework.

Step 1: Understand the technical products in the R&D project

In step of understanding technical products in R&D projects, it needs to communicate with R&D personnel and patent engineers of the enterprise. And the purpose of the communication is to know what are the application scenarios of technical products, what functions can be realized, what are the technical elements to achieve these functions, and the shortcomings of technical products, etc. The understanding of technical products in R&D projects should run through the entire patent excavation process, so it is necessary to maintain continuous communication with R&D personnel and patent engineers of the enterprise.

Step 2: Construct a technical framework in the technology products

After a preliminary understanding of the technical products in the R&D project, we begin to construct the technical framework of the technical products, which is a very technically demanding process. Generally speaking, the construction of technical framework in technical products requires a holistic grasp of technical products. On this basis, the technical framework related to technical products is presented in the form of tree diagram.

Specifically, when constructing the technical

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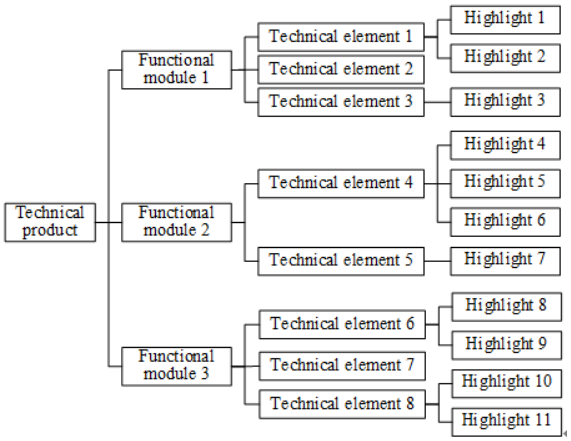
framework of technical products in the field of computer software, it is necessary to decompose the technical products into different functional modules, and then analyze technical elements of each functional module. In general, there are multiple technical elements under each functional module. After that, further list the highlights of each technical element. There may be multiple bright spots in each technical element, or there may be only one bright spot, or there may be no bright spot. So far, the construction of the technical framework in the technical products has been completed. As shown in the figure below, it is a technical framework model.



In the process of constructing the technical framework of technical products, the search for highlights is particularly important, because the main purpose of patent mining is to explore patents, and one bright spot is likely to become a patent, or even a higher quality patent. The determination of the highlights requires the cooperation of patent agents and corporate R&D personnel. Because in some cases, a patent attorney is required to guide the R&D personnel to find out the highlights of the project, because the R&D personnel may have forgotten the highlights of their own projects after completing a R&D project.

However, what is the highlight? The author believes that the highlight is the difference between our technical solutions and existing technologies. Take the data processing method as an example. Suppose the R&D personnel thinks that they have used a method that others have not used to process the data, like some special encryption processing on the data. This special encryption method is also a bright spot.

Step 3: Mining technological innovation points in the technical framework

After building the technical framework in the technology products, it is necessary to explore the technological innovations in the technical framework. The author believes that the technical highlights identified in step two, although different from the existing technology, cannot be directly used as a technological innovation. There are two reasons for this. In the first aspect, Article 22 of the Patent Law states: “Inventions and utility patents granted patent rights should be novel, creative and practical.” In fact, the technical highlights in Step 2 do not necessarily satisfy the three characteristics as stipulated in Article 22 of the Patent Law. In the second aspect, Article 25 of the Patent Law stipulates that “the rules and methods of intellectual activity are not used as objects for granting patent rights.” Because in the field of computer software, the R&D personnel generally like to use the various functions of the software as a starting point, with a description of how the user can operate to achieve this function. So in step two, the technical highlights provided by the developers are likely to fall into the category of intellectual activity rules and methods.

For the case mentioned in the first aspect above, in the process of patent excavation, the patent agent needs to fully search the patents similar to the determined technical highlights with the help of the patent search tool, and then judge the determined whether the technical highlights meet the three characteristics that patent applications must have in the patent law: novelty, creativity and practicality. If not, they cannot be used as technological innovations. For the situation mentioned in the second aspect above, the patent agent needs to perform an object evaluation on each of the determined technical highlights, that is, whether the determined technical highlights fall within the scope of intellectual activity rules and methods, and if so, it cannot be used as a point of technological innovation.

In addition, in the industry there is a saying "patent attorneys are half inventors." Therefore, for patent agents, it is necessary to add “extra” technological innovations based on existing technological innovations. The author's

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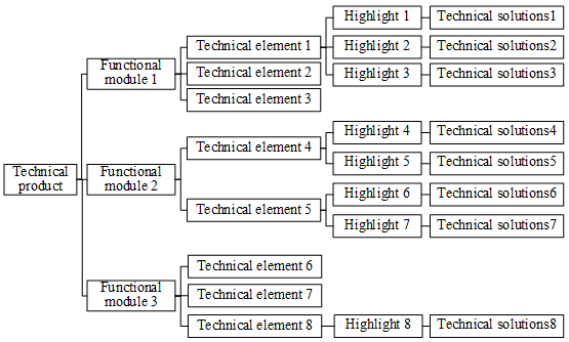
experience is that since most of the R&D personnel focuses on specific and specific technical means to solve their technical problems during research and development, as long as the method can solve technical problems, they will not consider whether other similar means can also achieve better technical effects, how to superimpose their technical means, and the technical concept of the entire invention. Therefore, it requires full and effective communication between the agent and the R&D personnel, and refines and expands the technological innovation points by drawing inferences about other cases from one instance. In addition, if the agent confirms that some technological innovations are basic innovations with high value, it is possible to further explore the derivative innovations around the technological innovation points and form a combination of technological innovations.

Finally, the agent also needs to sort out and summarize the technological innovations that have been mined, and finally form a complete technical solution. As shown in the figure below, it is a technical framework model after patent mining.



The practice of patent mining

This paper takes the automobile intelligent driving system developed by a company as an example to illustrate the process of patent mining.

The technical product in the R&D project is to design a car intelligent driving system, which has the functions of collecting data on driving data (such as road conditions and positioning data, automobile parameter data, human physiological data, etc.) and making intelligent decisions on vehicle behavior based on the data. Through communication with R&D personnel, we can understand technical products in R&D projects, construct technical frameworks in technology products, and mining technological innovations in technology frameworks, and finally determine technological innovations in technology products.

- Functional modules in technical products

Specifically, this set of automotive intelligent driving systems mainly includes system architecture modules, data acquisition modules, and intelligent decision-making modules.

- Technical elements of each functional module

The system architecture module includes the connection relationship of the various components of the system, the data transmission relationship, and the signal transmission method.

The data acquisition module includes data sensing design, data pre-processing design, and data storage design.

The intelligent decision-making module includes data learning design, vehicle behavior control design, and information feedback design.

- Technical innovation points of various technical elements

In terms of system architecture, it can be considered whether the network connection of the system adopts a new network topology, whether the data transmission of the system adopts a new data processing algorithm or a data processing flow, whether the signal transmission of the system adopts a new processing step or adopts a new delivery mode, etc.

For data acquisition, it can be considered whether better data sensing method is adopted, whether better data preprocessing algorithm is adopted, and whether more efficient and space-saving data storage method is adopted.

In terms of intelligent decision-making, it can be considered whether a better-performing data learning model or algorithm is adopted, whether a better vehicle behavior control mechanism is adopted, and whether a better-effect information feedback algorithm is adopted.

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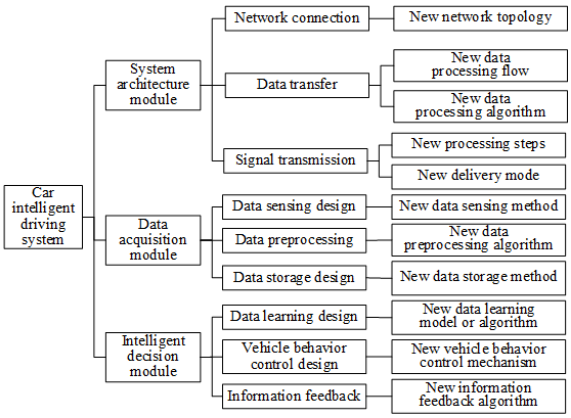
The above mining process is shown in the figure below.



The precautions of patent mining

Patent mining is a skill-intensive work. The degree of completion of work directly reflects the patent divers' own business skill. As a professional patent staff, patent agent should demonstrate absolute professionalism in the process of completing patent mining. In order to ensure the high efficiency and high quality of patent mining, the author summarizes the following three points of attention based on his actual work experience.

- Improve communication efficiency

In the patent mining process, the patent agent's understanding of the technical products basically comes entirely from the research and development personnel. Therefore, the quality and efficiency of technical communication with the R&D personnel greatly determines the quality and efficiency of patent mining. Usually the daily workload of R&D personnel is very heavy, and R&D personnel has little knowledge about the patent system, therefore, when the agent frequently interrupts the work of the R&D personnel for inquiries, or when the problem asked by the agent is too patented to make the R&D personnel unable to understand, the R&D personnel will be dissatisfied with the work of the agent, which in turn affects the smooth development of agency work. Moreover, in actual work, due to the limitations of the conditions, the agent can only communicate with the R&D personnel by telephone and cannot communicate face to face, which makes the communication between the agent and the R&D personnel more difficult. To this end, before communicating with R&D personnel, the agent should fully prepare the content that needs to be communicated, and choose the right communication time. In the communication process, the agent should guide the R&D staff to say that we hope to get it. In addition, the agent should also take care of the emotions of the R&D staff and let the developers be willing to communicate with us.

- Importance of retrieval

The main purpose of the retrieval is to identify existing technologies that can undermine the innovation of technological highlights considered by R&D personnel in technical products. It will prevent uninitiated technical solutions from being rejected after applying for a patent, and thus help customers save manpower and financial resources. In addition, retrieving existing technology can help provide reference for developers to help developers create alternative solutions that bypass existing technologies. To this end, the agent should try to ensure the recall and precision of the prior art when searching for existing technology.

- Good at finding problems

Einstein said: "It is often more important to ask a question than to solve a problem." This also applies to patent mining. Although patent mining is a process for finding a solution to a problem, the ultimate goal of patent mining is to apply for a patent. In fact, there are many problems in our lives. If these problems are discovered, we can easily find a solution to these problems. However, since these problems are not found, the solution to the problems cannot be discussed. Therefore, in the process of patent mining, the agent should also explore other technical problems existing in the technical products in the process of technical communication and understanding with R&D personnel, and communicate with the R&D personnel to get new technological innovations to solve new technical problems by discussion.

Summary

In the field of computer software, the technical solutions are generally abstract methods, so they have certain particularities in patent mining compared with other technical solutions. This article mainly discusses the

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patent mining based on enterprise R&D projects from the perspective of patent agents in the field of computer software.

In fact, patent mining can be explored from different perspectives. Regardless of how to conduct patent mining, the general idea and purpose are the same. That is to say, through effective patent mining, it can avoid the loopholes in patent protection of scientific research results, and with the support of the existing technological achievements, the scope of patent protection is extended to all technological innovation points with patent application value.

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Mr. Zhen graduated from Nanjing University of Information Engineering with Bachelor of Science degree, and graduated from Nanjing University of Technology with Master's Degree in Engineering. He has published many professional articles in magazines such as Science and Technology Management Research. Mr. Zhen is experienced in patent search and analysis, patent layout, patent application drafting, response to official actions, patent reexamination and patent invalidity. He has rich professional technical knowledge and patent practice experience in display technology, communication technology, computer software, artificial intelligence and electronic commerce. Mr. Zhen has also provided patent mining service for many enterprises, and has a very rich practical experience in patent mining especially in the field of computer software patent mining.

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