DESIGN AND IMPLEMENTATION OF SCI-TECH NOVELTY RETRIEVAL SYSTEM

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ABSTRACT. *Sci-tech novelty retrieval is to provide decision reference service for the novelty of scientific research and the appraisal of scientific achievements by means of retrieval and comprehensive analysis and comparison. It is a support system for scientific decision making in scientific research management. In order to improve the efficiency of sci-tech novelty retrieval, and give full play to the positive role of sci-tech novelty retrieval in the implementation of innovation-driven development strategy, we have launched the construction of "sci-tech novelty retrieval analysis system" to integrate existing resources, deal with and fusion, as the bottom resource of sci-tech novelty retrieval and analysis, integrate the tacit knowledge of novelty retrieval personnel into the business process of the system, and provide the characteristic function services such as automatic generation of novelty retrieval style, and structural retrieval. The auxiliary novelty searching staff provide scientific research establishment evaluation, innovation evaluation, scientific research achievement appraisal and other professional novelty retrieval services for scientific research institutes, colleges and universities, enterprises and other innovative subjects.*
Keywords: Sci-tech novelty retrieval, Analysis system, Novelty retrieval service

1. **Introduction.** Sci-tech novelty retrieval in China can be traced back to the mid-1980s [1]. In 1990, the former State Science and Technology Commission set up the first batch of novelty searching institutions and promulgated the measures for Administration of Sci-tech novelty searching and Consulting work and the rules for the implementation of the measures for the administration of sci-tech novelty retrieval and Consulting work, etc. [2]. In 1990, 1994, 1997, a total of 38 national-level novelty search advisory units were published in three batches. The State Council's views on speeding up the development of science and technology service industry No. 2014 pointed out: "strengthen the market development and utilization of science and technology information resources, support the development of competitive intelligence analysis, sci-tech novelty retrieval and other scientific and technological information services" [3]. This fully shows that our country has further strengthened the importance of sci-tech novelty retrieval and other information service industries.

With the advent of the network era, the Internet technology has been unprecedented rapid development in the world, to a large extent, has changed the traditional way of information exchange and life style. It speeds up the process of mankind stepping into the knowledge economy era of "information explosion". On the one hand, the demand for intelligence information in the network environment is increasing greatly, and the traditional means of novelty searching are far from being able to meet the development

needs of sci-tech novelty retrieval under the current situation. On the other hand, with the implementation of innovation-driven development strategy in depth, breadth and intensity, the quantity of novelty retrieval has increased dramatically, and the phenomenon of multi-stage business peak is also presented every year. The human resource reserve and service efficiency of novelty retrieval institutions are brought along with it to great challenges [4].

In order to improve the efficiency of sci-tech novelty retrieval, we have carried out the construction of "sci-tech novelty retrieval and analysis system", integrating, processing and integrating existing resources as the underlying resources for scientific research and analysis, and exploring the tacit knowledge of new personnel. Integrate into the system business process, provide special functions such as automatic search, retrieval, structure retrieval, and assist the new staff to better provide scientific research evaluation, innovation evaluation and scientific research evaluation for innovative institutions such as research institutes, universities and enterprises.

2. **Related Work.** Since the emergence of "sci-tech novelty retrieval", many university libraries and information offices have successively obtained the qualifications for novelty searching, and developed their own science and technology novelty retrieval systems for their own units or the society as a whole, and some novelty searching institutions have developed their own science and technology novelty retrieval systems one after another.

For example, the science and technology retrieval service platform of the Chinese Academy of Sciences, which constructs convenient retrieval network service for users, and designs three main functional modules according to different roles: business module, work module and business management module [5].

Tsinghua University science and technology novelty system, which is based on the network (B/S) business development and management platform, uses Microsoft ASP. Net dynamic server page technology, combined with SQL Server 2005 relational database, running on windows 2003 server operating system platform, realizes two main functional modules, user module and work module, and the working module contains five sub-modules [6].

The platform of science and technology is in Zhejiang University Library, the system development environment is J2EE, the operating system of system server is Windows 2000 Server, and the system application server is WebLogic Server 7.0 of Bea Company. MVC model framework can help developers to develop Web applications using J2EE, can achieve information release, and novelty entrustment users can be entrusted and queried on the Internet [7].

The library of Suzhou University provides the management system of the sci-tech novelty retrieval archives based on Ajax, which first authenticates the users, and then inputs the information of searching for the new, and editor and electronic document upload, edit and maintain the system source code [8].

For Sichuan Medical and Information Research Institute of Science and Technology Project novelty management system, the database platform is SQL Server 7.0, provides the interface with the electronic version mesh word table, and can carry out the new search manager, the new search personnel, financial personnel and users at different levels of hierarchical management [9].

For Beijing Institute of Science and Technology Information Institute of science and technology novelty service system, mainly by the novelty business subsystem, user management subsystem, Web site management subsystem and online communication subsystem are composed of four functional modules, using struts+spring+hibernate technology framework, the application of SQL database [10].

For the integrated business platform of science and technology retrieval of Qingdao Institute of Science and Technology Information, the application of B/S structure and Microsoft's ASP dynamic server page technology, the combination of ACCESS2003 relational database, using Dreamweaver MX 2004 to develop web site and application program, eight main functions are realized, that is, novelty search contract management, database resource management, new class management, staff management, report query and statistics, announcement management, data export and report form generation [11].

The management information system of science and technology novelty retrieval in the new search station of Central South University adopts the B/S network architecture, develops the system in layers based on SSH architecture, and uses Ajax technology to enhance the Web application in the client side. The EasyUI component based on jQuery is used to build a unified, beautiful and interactive user interface [12].

For Shandong Medical and Health Science and Technology Information Institute of science and technology information system, the paper puts forward the implementation scheme of Ajax mechanism proxy prompt filling and fast submitting proxy, networked management of proxy, and immediate communication of entrusting system. It mainly uses .net technology and Ajax technology to realize [13].

Scientific and technological novelty retrieval is a special information consulting service in China's science and technology system. Foreign information service is carried out through information retrieval, and the form of patent information analysis is the main form. Many foreign professional information consulting institutions rely on their own resources to develop a powerful patent analysis tool to provide technical support for the development of information services [14].

3. **Design of Sci-Tech Novelty Retrieval and Analysis System.** This part gives a brief introduction to the system design idea, the design flow of the system, the characteristics of the system and the operational role of the system.

3.1. **Design thought of the sci-tech novelty retrieval.** Combined with the service demand of science and technology innovation, this paper selects, appraises and arranges the documents in the subdivision field, and carries on the data mining, statistics, sorting, comparative analysis and research to reveal the deep dynamic characteristics of the documents. Implement the functions of statistical analysis, technical evaluation and technical prediction, and provide friendly visual interaction. This paper provides an objective and accurate document retrieval and evaluation reference for the novelty search and analysis personnel, and improves the efficiency of the novelty retrieval and analysis.

3.2. **The process of sci-tech novelty retrieval and analysis system.** According to the process of novelty search specification, the process of novelty searching includes seven steps, that is, entrustment and acceptance, retrieval, writing new search report, checking and checking, issuing new search report, reviewing and filing new documents [15]. Among them, the retrieval process is divided into nine steps: refining the subject, determining the retrieval scope, selecting the retrieval tool, determining the search term, formulating the retrieval formula, evaluating the retrieval result, adjusting the retrieval strategy, stopping the retrieval, and obtaining the retrieval result, as shown in Figure 1.

From the perspective of the sci-tech novelty retrieval process, sci-tech novelty retrieval is a complex integrated business, its rigorous, normative, not only scientific and technical, but also mechanical, cumbersome and repetitive work, which cost more time to check new staff, especially in the face of business peaks, these problems are more prominent. Even when the commissioning is busy, there will be omissions, directly affecting the quality and efficiency of the new search. At the same time, with the advent of the information age, commissioned by the technical services of more diversified customer types, service demand synchronization growth, the service efficiency and convenience of higher demand, the need
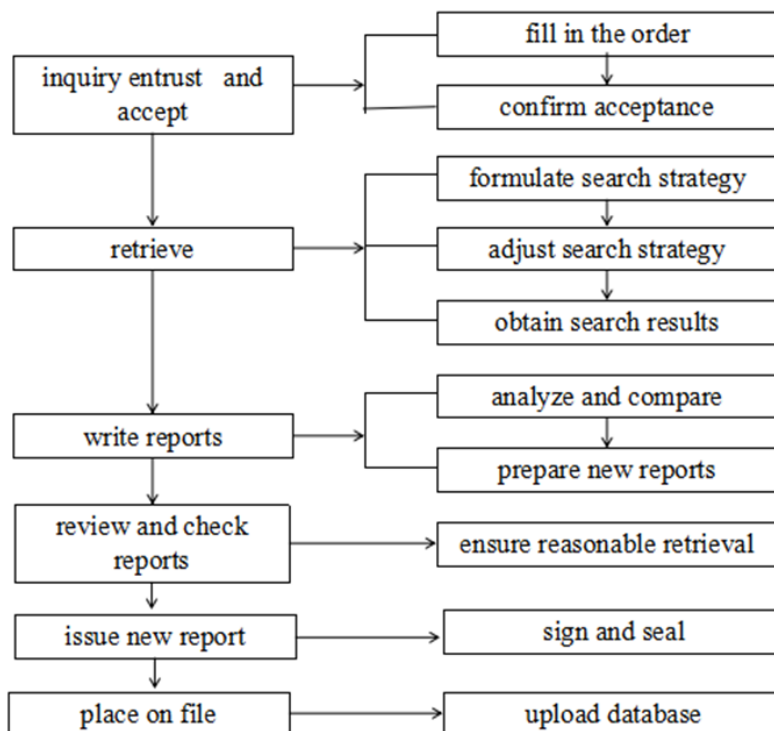
FIGURE 1. The process of sci-tech novelty retrieval

for more real-time communication and information interaction platform, to achieve more intelligent, user-friendly services.

4. Realization of Sci-Tech Novelty Retrieval Analysis System.

4.1. Roles in sci-tech novelty retrieval analysis system.
User roles are divided into clients, answer questions, search new, auditor and check new administrator.

Client: Post a new task and submit a power of attorney. Answer the question member: the preliminary judgment power of attorney, the conformity according to the actual situation assigns to the novelty search new member, unqualified returns the trustee.

Search novelty: Responsible for consultation with the client to amend the power of attorney, the power of inquiry to create new reports. At the same time to check the new report has the right to file.

Auditor: Check whether the new report is qualified, if qualified send to the new search clerk to file.

Search novelty admin: Have permissions to view, modify, delete, configure roles, and groups for all users.

4.2. Features of sci-tech novelty retrieval analysis system.
Sci-tech novelty retrieval analysis system has the following characteristics: 1) it can be online to receive new applications commissioned; 2) it can search and search through the new application number, the Chinese/English name, the entrusted unit, the entrusting person, the reporting date and so on different search entrances; 3) for different people's work needs and the use of authority, set up a new search project hierarchical management, etc. 4) it provides the characteristic function service of retrieval type automatic generation and structure retrieval.

Sci-tech novelty retrieval analysis system has realized the client to propose the new inquiry, online fill in or upload the power of attorney, check the new organization online processing, and by the agency responsible for the new task assigned; sci-tech novelty organization, upload new report; the client can inquire the progress of the new work and

FIGURE 2. The homepage of sci-tech novelty retrieval system

FIGURE 3. Conceptual lexical structure

download the new report online. The homepage of sci-tech novelty retrieval system is shown in Figure 2.

The system builds the concept hierarchy and relationship automatically by analyzing the new power of attorney, combining the thesaurus and encyclopedia data, as shown in Figure 3.

Combining with the data of thesaurus and encyclopedia, the system automatically builds the new model, according to the model, the system can automatically construct the retrieval type, as shown in Figure 4.

With all the related materials, the system can automatically generate a new report, as shown in Figure 5.
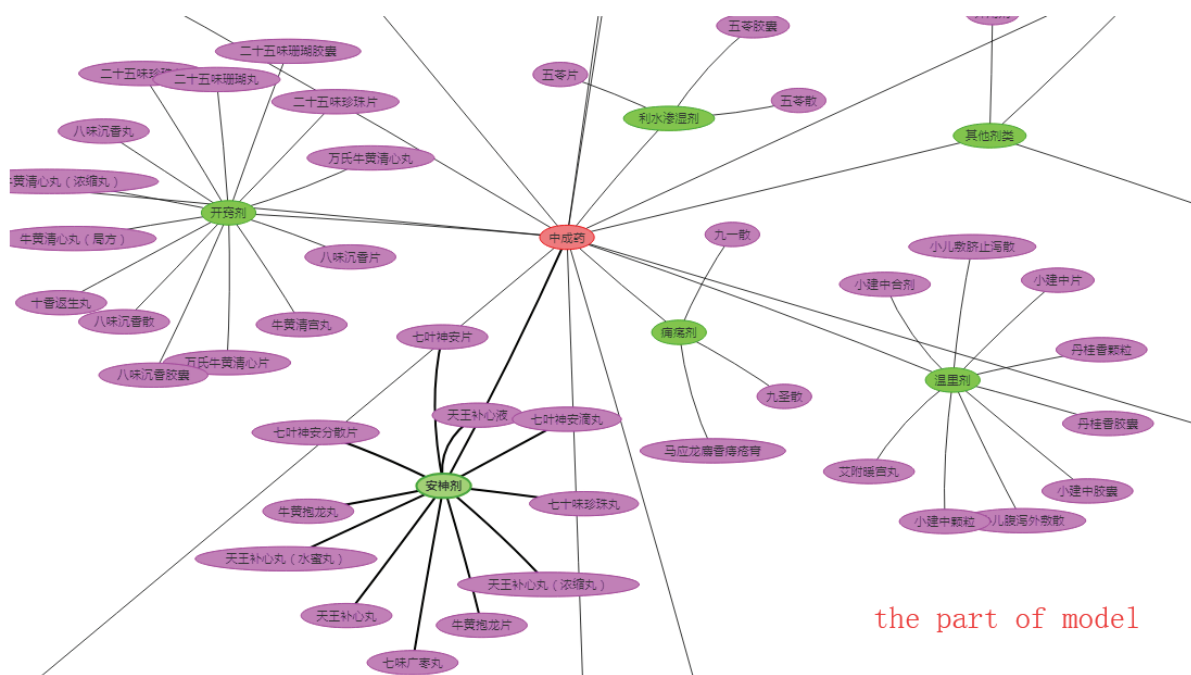
FIGURE 4. Sci-tech novelty model

FIGURE 5. Generation of search reports

5. **Conclusion.** By comparing the artificial search, the probability of hit search words is relatively high, through the comparison we found that the authors and publications are more detailed with the literature in the new report, to achieve the expected effect, improve the efficiency of sci-tech novelty retrieval, and better play the role of sci-tech novelty retrieval in the implementation of innovative driving development strategy. By processing and integrating existing resources as the underlying resources for sci-tech novelty retrieval, it provides features such as automatic generation of novelty search and retrieval, structure search and other special services, and assists novelty search staff to provide scientific research evaluation, innovation appraisal and scientific research and evaluation for scientific research institutes, universities, enterprises and other innovative subjects.

Therefore, the use of sci-tech novelty retrieval system effectively utilizes the convenience of network information, facilitates the information exchange between new clients and new agencies, and facilitates the normalization of new reports and the scientific and automatic management of novelty search, effectively avoiding duplication and waste of scientific research.

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