Design and implementation of longitudinal project management system

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Abstract: In recent years, China has been adhering to the strategy of rejuvenating the country through science and education, strengthening the country through talents and innovation driven development. More and more attention has been paid to the construction of colleges and universities. Therefore, colleges and universities pay more and more attention to scientific research projects. However, due to the project management involves a large number of tedious and miscellaneous data, each scientific research project management statistics is a huge project, the traditional project management method is not suitable for the current project management. Based on this situation, this paper puts forward the idea of vertical project management system from the perspective of research background and research status, and uses the idea of object-oriented to write the system code, so as to realize the system function. In this project, Vue, spring boot and MyBatis are used as the main technologies, IntelliJ idea is used as the development tool, SQLSEVER is used for data storage, and then the vertical project management system is realized.

1. Instruction

In the past, the traditional subject application methods cannot adapt to the society and meet people's needs. The rapidly developing information age, the changing social science and technology and information technology, and a large number of complex and cumbersome data and information have brought difficulties to managers. People gradually realize the powerful data processing function of computer. Each subject statistics work is a huge project. If the traditional working method is adopted, it will not only delay the work timeliness, but also make it difficult to control the latest progress of subject research in time. It is urgent for the scientific research management department to change the traditional management mode and change the traditional manual management into information and network management mode.

Maintaining the subject management system is a part of the main work of daily management in colleges and universities. Whether the subject management is good or not is directly related to the application of colleges subject projects [1]. With the continuous changes and updates of the school teaching system, the management of school subjects by the personnel of the subject management system has become more and more complicated. Considering these situations, there is an urgent need

for subject management system. The development of vertical project management system can not only reduce the waste of human, material and financial resources, but also help to improve the efficiency of project management system. There are many subject management systems in China. The emphasis and technology of this system are different, and the emphasis on implementation is also different according to different needs. Therefore, we should combine the actual situation of the school, fully understand the needs of the school, and then design a suitable, school characteristic and school's own intelligent shared topic management system.

2. Requirement analysis and system designment

2.1 Requirements analysis

From the perspective of role management, the vertical subject management system can be mainly divided into four modules: science and technology department module, secondary college administrator module, teacher module and external audit expert module. The following describes the functional requirements of each role module with each role as the main body.

The module of science and technology department mainly includes the following functions: viewing the published topic information, topic publishing and project management. For the science and Technology department, when users successfully log in to the system, they can see the published topic information. The system provides paging function. They can click the page number or the next page to view it. This page needs to provide a button to view the detailed topic information. Then, you can publish the topic. After successful publishing, the page will jump to the topic announcement list, and users can view the topic information they just published. In addition, users of the science and technology department also need to conduct the final review of the projects declared by teachers that have passed the preliminary review of secondary colleges. It should be noted that whether the subject needs expert review is also determined by the science and Technology department; When the science and Technology department conducts project audit, if the project needs expert audit, the science and technology department need to provide external audit account number. If the project passes the audit, it will be transferred to project initiation, or continue to report. If the project fails to pass the audit, it can be divided into rejection and rejection. Rejection reasons need to be provided so that the project applicant can make corresponding modifications and apply again. In order to achieve the purpose of successful project application. As the operator of releasing the project, the science and technology department needs to see the experience of the whole project, that is, the project progress, and can clearly know which personnel have operated these projects.

The secondary college administrator module mainly includes the following functions: viewing the published topic information and reviewing the declared topics. For secondary college administrators, when users successfully log in to the system, they can enter the home page to see the published topic announcements. The system needs to provide paging function. When clicking the page number below the topic announcement list or the next page, they can see other topic announcements; There should also be a button to view detailed topic information on the current page. The administrator of the secondary college needs to conduct a preliminary review of the project declared by the teacher. If the project passes the review, it will be transferred to the science and technology department. If the project fails to pass the review, it can be divided into two situations: rejection and rejection. The rejection requires the reviewer to provide the rejection reasons so that the teacher applying for the project can make corresponding modifications. After the modification, it will be declared again in order to pass the review, Conduct project research.

The external audit expert module mainly includes the following functions: review the subject items requiring external audit, decide whether to pass or reject, and fill in the rejection reasons for rejection. For external audit experts, after they successfully log into the system according to the account and

password given by the science and Technology department, the home page is the expert review page, where they can see the items that need to be reviewed by themselves, and then the external audit experts give comprehensive consideration and review opinions according to relevant regulations.

2.2 System designment

The system can release, view, declare and review topics for topic management. The functional modules are shown in Figure 1.
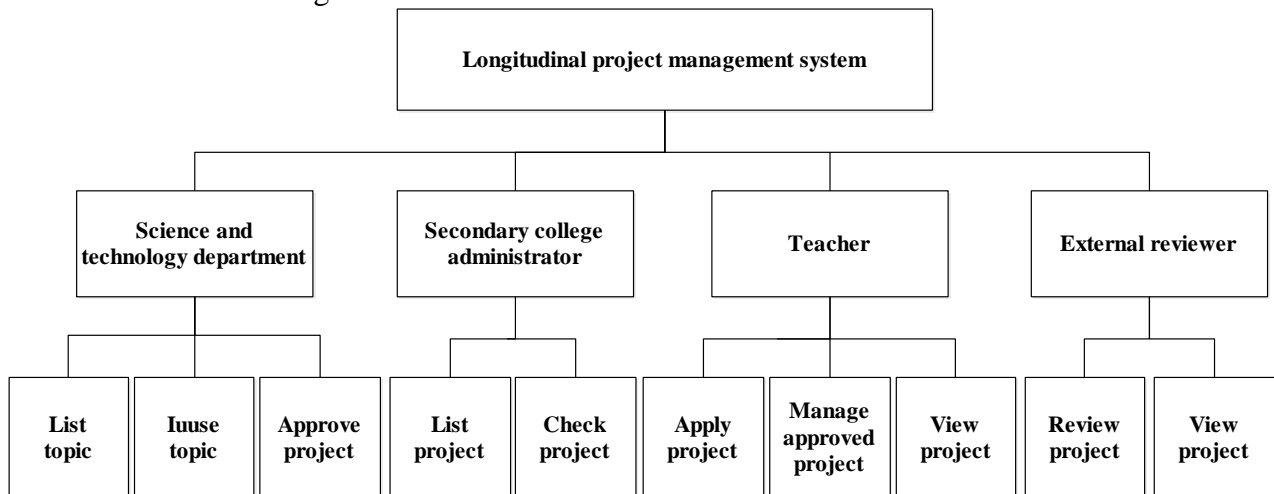

Figure 1: Functional modules diagram
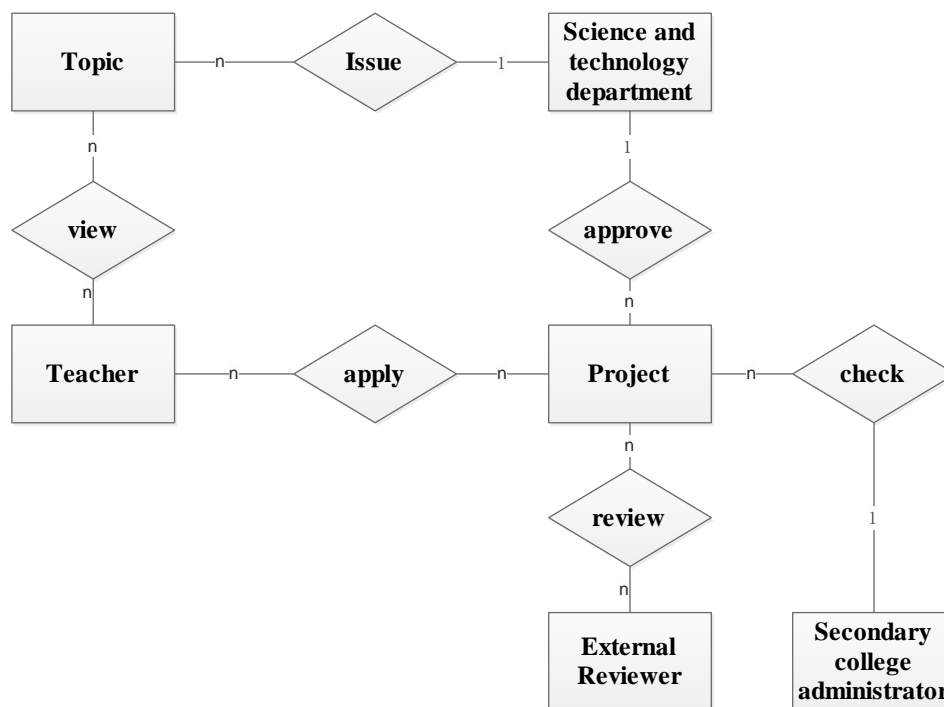
2.3 Database designment

Figure 2: ER diagram

Database design usually designs E-R(Entity-Relation) diagram and entity attribute diagram. E-R diagram belongs to conceptual model, which can clearly show entities, entity attributes and the relationship between entities [2]. Entity attribute diagram uses a data model to describe the attributes of entities. The data table of this topic conforms to the third paradigm. The fields in the table are neither redundant nor derived from other fields. The figure 2 is the E-R diagram and entity attribute diagram in the vertical topic management system.

3. System implementation

The system development adopts the front-end and back-end separation mode. The back-end only returns the data required by the front-end. The front-end is responsible for rendering HTML pages, and the back-end no longer controls the effect of the front-end. In this mode, each view developed by the back end becomes an interface or API, and the front end adds, deletes, modifies and queries the data through the access interface [3].

3.1 Back-end implementation

The system development is based on Java language, using the upgraded spring boot of spring framework and MyBatis and Maven warehouse. Spring boot is applied to introduce annotations and integrate a large number of frameworks, which simplifies the configuration and development process of web framework and avoids the problem of version conflict caused by third-party dependence on packages. MyBatis is a Java based persistence layer framework that supports object mapping. It has built-in JDBC (Java Database Connectivity) and only focuses on SQL. The front-end and back-end data interaction is realized through the spring boot framework, and the three-tier architecture model controller, service and DAO (Data Access Object) layers are applied [4].

3.2 Front-end implementation

The front-end of the system is realized by Vue. Vue, as a front-end progressive MVVM(Model-View-ViewModel) development library, simplifies DOM operation. MVVM mainly includes template parsing, responsive listening and first rendering [5]. In the system, data changes will be monitored in real time through the core function object.defineproperty. Embedding and logic are realized through templates in the system. Render function is required to realize rendering, and the template is transformed into HTML code through JS code. When the page is loaded for the first time, it will render for the first time, display the page, and bind dependency.

4. Conclusion

National Development and education are inseparable, and the development of colleges and universities should not only pay attention to the level of education, but also analyze the scientific research ability of colleges and universities. With the increasing social attention to the reform of teaching and scientific research in colleges and universities, more and more teachers pay attention to the application of subject projects, and the enthusiasm and demand of teachers to participate in the application of subject projects have been further improved. There are many problems in the traditional project management mode, such as poor information exchange, high-cost management, lack of process management and inadequate application and promotion. Therefore, the development of subject management system based on modern information technology and modern management concept plays an irreplaceable role in university management.

Aiming at the complex and cumbersome work of subject management, this paper designs and

implements the front-end module of vertical subject management system. The main implementation modules include login module, subject notification module, project application module and project review module. It mainly realizes the functions of publishing subject, project application, viewing project application progress, project review and so on.

Acknowledgements

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