Design and Development of University Teacher Management Information System Based on ASP.NET Technology

Chunlin Yang[1]

[1]*Tianjin Maritime College, Tianjin, China*
38077024@qq.com

Abstract:

The information management of teachers plays an extremely important role in the quality management of talents in colleges and universities, but there are many problems in practice, such as untimely information processing and difficulty in information sharing. Therefore, it is very necessary to construct an efficient teacher information management system for the continuous management of school teachers, which provides a solid foundation for the integration and sharing of information within the college. Aiming at the outstanding problems in the management of university teachers' information, based on B/S architecture, this paper applies ASP.NET server development technology, absorbs the advantages of MVC development idea, builds the framework of WEB application system, and uses SqlServer database for further design and development. The development based on ASP.NET and MVC pattern not only improves the development efficiency, but also improves the maintainability and reusability of the code. To study the problems encountered in student information management, this paper first expounds the purpose and importance of system design, analyzes the current situation of faculty information management in colleges and universities, points out the difficulties encountered by faculty information in business management, and gives the solution and the main realization direction of system development combined with the actual needs.

Keywords: teacher information; web management system; ASP.NET; MVC

1 INTRODUCTION

In order to realize the modernization goal of the state and society for colleges and universities, to meet the needs of the teaching reform and development of colleges and universities in the new era, and to implement the strategy of "strengthening colleges and universities with talents" and to strengthen the construction of talent team, colleges and universities must conduct in-depth research, think carefully, plan the future, and make a good plan for the introduction and development of teachers and talents. It is a new task for university management departments to introduce excellent teaching and scientific research talents, build a team of high-quality teachers with innovative ability and research spirit, and improve the teaching quality and scientific research level.

Teachers in colleges and universities are not only the main body of knowledge dissemination, but also the backbone of scientific research. Only by making the system of managing and building teachers more sound can colleges and universities promote the sustained and long-term development of national education. In the process of building the teaching staff, it is mainly necessary to coordinate the flow of teaching staff, that is, to solve the three links of "coming, going and staying". Among them, "coming" refers to the recruitment and introduction of teachers' talents, "going" refers to the transfer or outflow of teachers' talents among various departments in colleges and universities, and resignation. "Staying" refers to adopting some strategies to keep talents in our school, such as encouraging the creation of scientific research projects, arranging regular training, and setting up semester examinations. Only in this way can colleges and universities attract, retain and cultivate more talents, and with the help of talents, they can cultivate more outstanding students, stimulate the creation of talents more fully and set up more good scientific research projects. In this process, a lot of teachers' information data will be produced, and there are a lot of data involved in the middle. It is necessary to be more careful in processing the data of important data files

and scientific research achievements, and some mistakes will occur if you are not careful. If there is a turnover or resignation between faculties related to teachers, the processing process will be more complicated. Next, analyze the problems existing in processing information and how to manage these data efficiently [9].

With the continuous development of Internet technology, information resource management has gone deep into the management of university teachers. Teachers' information needs to be transferred back and forth between different departments in colleges and universities, and the data is easily mixed or lost in the process of retrieval. Moreover, every year, teachers in colleges and universities have a high mobility, or they are promoted or transferred or leave. The mobilization and circulation of these information will have a great impact on the construction of teachers in colleges and universities, and it is complicated to deal with them. The traditional information management mechanism and methods can no longer meet the needs of the construction and optimization of teachers in colleges and universities [10]. Therefore, the traditional management mode has been unable to meet the actual needs of teachers' information management in colleges and universities. With the accelerating process of information construction in colleges and universities, the scale of running a school and the growing number of teachers in colleges and universities, how to do a better job in managing teachers and building teachers' team, so as to realize standardized and rational teacher information management, has become the primary problem to be solved in colleges and universities at present [5]. Therefore, the author believes that the development of an efficient and practical information management platform for teachers by combining the web idea with ASP.NET technology is conducive to solving the problems existing in the current information management of colleges and universities, and thus speeding up the reform of information management for teachers. Based on the research of university teacher information management and the current difficulties, this paper designs two subsystems in the system to store, retrieve and manage teacher information in an all-round way, namely, the teacher management department user subsystem and the teacher user subsystem. All teacher information is integrated into one system, which is not only convenient for managers to add, delete and check, but also can be checked by searching the teacher's name when each department needs to retrieve it. It is also convenient for teachers to view personal files and other information, and directly apply in the system when necessary, which is easy to operate and convenient to call.

2 TECHNICAL OVERVIEW

2.1 ASP.NET

Before introducing ASP.NET, let's talk about ASP. ASP is a dynamic Web page technology developed by Microsoft. In the web system, when a user initiates an access request through HTTP stateless protocol, ASP will generate relevant web pages on the web server and send them to the user [7]. Compared with the traditional HTML, some functional limitations of ASP static web pages have made a breakthrough change, realizing the effect of dynamic web pages, integrating with HTML codes, and facilitating later modification and testing. ASP.NET is a new generation of web programming language designed by Microsoft on the basis of ASP, but it is quite different from the old version of ASP. It provides developers with basic software programs, programming models and various services to help them develop robust and efficient web applications.

ASP.NET application is compiled code, which is written with extensible and reusable components and objects and runs in the framework of. Net framework. It can be programmed by using modular scripting languages such as C++, C#, Visual Basic, etc. Compared with ASP, its biggest advantage is that it only needs to be compiled in the first execution, and the subsequent execution does not need to repeat this step, which greatly saves the compilation time and improves the running efficiency of the code [8]. Compared with ASP's shortcoming of mixing interface design and program design, ASP.NET developed the interface design and program design in different file forms, which greatly improved the reusability and maintainability of the code. Figure 1 shows the workflow of ASP.NET application.
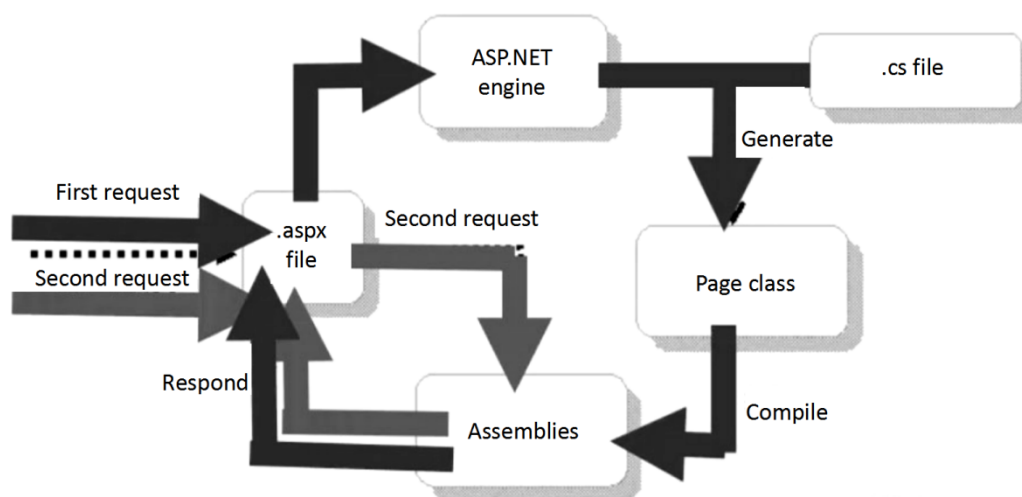
Figure 1: ASP.NET workflow

2.2 C# language

In this paper, the script language used in the development of ASP.NET project is C#. This paper gives a brief overview of C#. # C is an object-oriented programming language with high versatility. It not only cuts down the more complex features of C++ and Java languages, but also provides visualization tools to write applications more efficiently. NET is a development platform, while C# is a programming language used for development on. NET. At present, there are many development languages that can be used on. NET platform [2]. However, C# language is most widely used on the. NET platform. In order to simplify programming, C# cancels the pointer. It provides many data types that c++ and Java do not have, and each data type has its size defined. This paper uses c# as the script language for system development, because of its simplicity and security.

2.3 SQL Server

SQL Server is a relational database management system developed by Microsoft. It is easy to use, scalable and highly integrated with related applications. It can also be used across platforms, from running on Microsoft Windows 98 operating system to running on Microsoft Windows 2012 operating system and other platforms. SQL Server 2008 is a very heavyweight development version. It has introduced many features that previous versions did not have, and made improvements to key features and functions. Because of this, it has become the most powerful and comprehensive version of SQL Server database today, and is very popular. SQL Server 2008 is published on Microsoft's data platform, which can store and manage any type of data. Data, whether structured, semi-structured or unstructured, can be directly stored in SQL Server database. With the emergence of SQL Server 2008, Internet companies can run more important applications, and at the same time provide technical support for data management and information preservation on the premise of reducing costs. Figure 2 shows the process of SQL Server storing data.
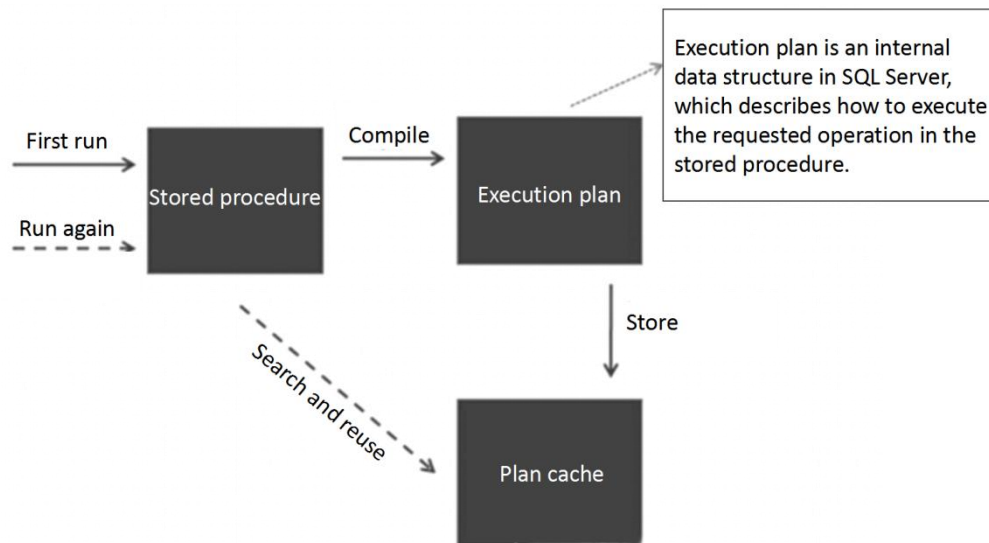
Figure 2: SQLServer stored procedure

2.4 Development environment

In the process of designing and developing the system, the following platforms and running environments are selected: the operating system is Windows7, the development environment is Microsoft Visual Studio 2012, the Web server is IIS version 7.0, the framework is Net framework, the database is SQL Server version 2008, and the operating system selected for the running environment is Windows and Web browser [1]. The following development and running environments are installed and deployed: firstly, install and configure IIS server in Windows system, open the startup or shutdown Windows function in the control panel program, find Internet information Services, check all the components in it, and after selecting and confirming, the system will automatically start downloading and installing IIS server program. Wait for a while, open the browser, and test whether the installation is successful. Enter http://localhost/ in the address bar of the browser, and the IIS screen appears, that is, the installation is successful. Then, deploy the. Net framework environment, first download an MDAC, download the. NET Framework 3.0 framework, the. NET Framework 3.0 SDK kit and the. NET Framework 3.0 Chinese language pack, and complete the configuration of adding. net Framework4.0 to IIS. Then, right-click and select Internet information Services Manager in Services and Programs under Management, click default web site, double-click ASP to start the parent path to True, then go back to IIS to edit and select Default Web Site, and right-click and select Manage Web Site-Start. Then install and configure the SQL Server database, download and install the sql server 2008 version of the installation package. After the installation is completed, enter the support rules of the installer, click Show Details, enter the function selection, select All, enter the instance configuration, and select Name Instance. Everything else is set by default. Enter

the server configuration, click to use the same account for all SQL Server services, check "NT AUTHORITY\SYSTEM", and everything else will be as default, and add database information under the root node of web.config to connect to the database. Finally, install and configure ASP.net development environment VS2012. Other configuration pages appear in the installation prompt, select the required environment settings, then start and write "hello world" for testing, and publish the ASP.NET test website just written on IIS server. The above-mentioned installation configuration of development environment provides a feasible guarantee for the development of teacher information management system.

3 REQUIREMENTS ANALYSIS

3.1 System requirements analysis

As the reform of the teaching system in colleges and universities continues to deepen and the scale of running schools continues to expand, the management of teachers' related information is becoming increasingly arduous. The traditional management of teachers' archives information is mainly handled by the educational administration office of colleges and universities. They manage all kinds of information through relatively convenient office software combined with manual statistics, and there are some shortcomings in the management process, such as low work efficiency, error-prone and leakage-prone information. Especially in the stage of teachers' mobility and evaluation and examination of teaching achievements, the workload of inputting, inquiring and integrating basic information of teachers and published papers and works is several times more than usual. Moreover, there are many inconveniences when teachers check and retrieve personal files, report scientific research achievements

and other information. In order to solve the problem of information management of teachers and improve the teaching quality of schools, it is necessary to design the information management system of teachers from the aspects of teacher training, information files and assessment, so as to carry out all-round statistics and management. According to the current situation of information management of teaching staff in colleges and universities, the author of this paper decided to design the system as B/S mode through research. The application program adopting this mode can provide convenience for the faculty and staff to use, upgrade and maintain the system [6], and realize the information management of the data of teacher recruitment, teacher training, teacher assessment, teacher files, teaching research and so on. It is not only convenient for teachers in colleges and universities to manage and master the construction of teaching staff, but also convenient for teachers to obtain relevant data, check training arrangements and apply. Therefore, it is a very meaningful thing to set up an efficient and convenient teacher management information system to improve the level of teacher management.

3.2   Global design

The overall design framework of the teacher information management system in this paper is shown in Figure 4. The server of the system is developed by ASP.NET technology, and its script language is C #. Net framework (.NET Framework) has made the underlying programming model for it. The SqlServer database, which is the product of Microsoft Company with ASP.NET, is selected as the database, which has good compatibility. The main interaction process of the system is as follows: the user sends http request through the client, and the browser encapsulates the request message

and sends it to the IIS server. IIS sends the monitored browser request to W3SVC service. W3SVC obtains the working process of the target application and makes a judgment. If it is a static file, it will return to the original path. If it is a dynamic file, it will load the dynamic resources with aspnet_isapi.dll, supervise and process them with CLR, and call the corresponding ASP.NET program. During the execution of ASP.NET, if it is necessary to call the data in Sql Server, the written DataReader method is used to read the information of the database.
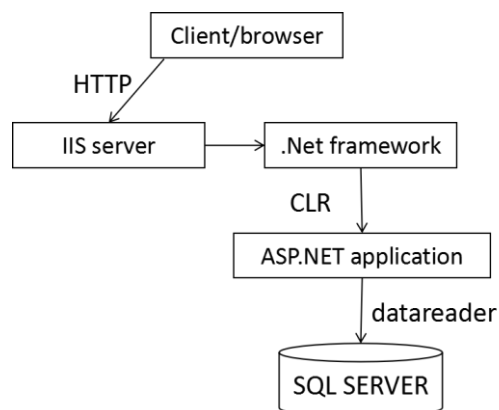

Figure 3: Overall architecture

4   FUNCTION IMPLEMENTATION

According to the requirement analysis of the system in front, the modules of the information management system of the whole faculty construction can be divided into two main clients, namely the teacher management department client and the teacher client. All the information in the system is added, deleted and checked by asp.net calling the operation database, which is the key code of calling the database as shown in Figure 4.

```
case "SQLServer":
MyConnection = new System.Data.SqlClient.SqlConnection(MyConnectionString);
break;
case "Oracle":
MyConnection = new System.Data.OracleClient.OracleConnection(MyConnectionString);
break;
case "Access":
MyConnection = new System.Data.OleDb.OleDbConnection(MyConnectionString);
break;
case "DB2":
MyConnection = new System.Data.Odbc.OdbcConnection(MyConnectionString);
break;
default:
MyConnection = new System.Data.OleDb.OleDbConnection(MyConnectionString);
break;
```

Figure 4: Asp.net connection database code

There are five sub-modules under the client of the teacher management department, including teacher recruitment management module, teacher file management module, teacher training management

module, teaching research management module and teacher assessment management module. The management of teachers in colleges and universities is mainly carried out by two departments: Personnel

department and academic affairs department, in which personnel department is responsible for talent recruitment, personnel file management, staff resignation, retirement and transfer, while academic affairs department is mainly responsible for arranging training, setting up assessment, etc. In this system, the two departments can divide their work and manage each other's information, which provides a convenient network platform for the management of teachers in colleges and universities.

The personnel department can log in to the system to access the teacher recruitment management module to view the detailed files of each candidate, judge whether it meets the recruitment conditions of our school and confirm whether it has passed the examination, and issue an examination notice to those who have passed the examination. Teachers who have passed the examination in the later period do not need to submit files to the school again. The personnel department can directly store the files of this module into the file management module of teachers in school. The teacher recruitment management module is mainly responsible for unified management and examination of the application files and resumes filled by each candidate teacher, which improves the efficiency of examination files and subsequent files retrieval in the recruitment process [4]. The main function of the teacher file management module is to check, add, modify and delete the basic information files of teachers by the academic affairs office. The teaching management module is used to record the information of teachers' scientific research achievements, papers and works published and awards won in the teaching process. When a teacher applies for setting up a scientific research project or transferring or leaving the job to call out data, it reviews and executes the operation, and submits the relevant data to the teacher. The two sub-modules of teacher file management and teaching research management are convenient to view and retrieve at any time when teachers flow and need to change.

The administrator of the academic affairs office or department users can log in to the system to enter the teacher training management module to make statistics on teacher training arrangements and training conditions. The academic affairs office uniformly issues training programs and is responsible for reviewing the training reports uploaded by teachers after the training, which provides conditions for the construction of teaching staff and the retention of outstanding teachers. The teacher assessment management module is an important part of teacher assessment, which combines teachers' teaching ability, practical ability, scientific research ability, social ability and other comprehensive qualities. Teachers' performance and work completion during their teaching period are evaluated through mutual evaluation and the leaders of their departments. The assessment settings mainly set the templates, indicators, scores, processes and related parameters of various forms and categories of

assessment in detail. The assessment management is newly created and released by the academic affairs office in the system, and the assessment indicators and scores can be set in advance in the system [3]. In the end, the academic affairs office will review and proofread the evaluation information, which will provide data basis for the promotion of teachers' positions in the future, and provide convenience for the statistical evaluation results of the academic affairs office, and it can be transmitted in one stop when the personnel department needs relevant data.

There are also five sub-modules corresponding to the teachers' client and the teachers' management department's client. Among them, the teacher recruitment management module is not only used by school internal managers, but also has the right to register and upload information for external personnel. When external personnel log in to the teacher information management platform, they can check the instructions for filling in the report and upload the files required for teacher recruitment, and check the audit results and examination notices after the end of the audit period. In the teacher training management module, teachers can check the training notice and declare it according to the conditions. After being approved by the academic affairs office, they can participate in the training and submit the training report after the training. The archives management module and the teaching research management module have limited authority for teachers. Teachers have the authority to view their own archives information, scientific research achievements, papers and works, etc., and also have the authority to apply to the personnel department for opening scientific research projects and retrieving relevant information and archives. When applying for scientific research, transfer and resignation, there is no need to rush around and seal between departments, but only need to submit the corresponding application to the personnel department on the platform for approval, which is convenient and quick. In the teacher assessment management module, teachers can mainly rate others and view their own assessment results.

5 CONCLUSIONS

To sum up, as the key driving force for the development of education and scientific research in colleges and universities, the teaching staff plays an irreplaceable role in the process of school development. However, the information management system of teachers in colleges and universities is imperfect, which leads to a sharp decline in the management quality and efficiency of teachers in colleges and universities. In this regard, the author of this paper has designed and developed a teacher information management system based on the concept of openness, sharing and people-oriented. So as to strengthen the information management of teachers, innovate the evaluation

mechanism, introduce senior talents, improve the construction of teaching staff, improve the quality and level of teaching staff management, and lay a solid foundation for the all-round development of colleges and universities.

REFERENCES

[1] Cai Rui, Li Yuwei, Hu Jiming (2022).Research on Service Quality Evaluation of University Teachers Management Information System. China Education Info.03.

[2] Chen Xiaotang (2022).Design and Implementation of Project Management System Based on ASP.NET.Microprocessors.04.

[3] Liu Jie (2020). Discussion on the Management of Teachers in Departments of Higher Vocational Colleges from the Perspective of Human Resource Management. Henan Building Materials.01.

[4] Liu Peng, Li Dan et al (2022).Design and Implementation of Online Analysis and Processing System for University Teachers' Data. Electronic Design Engineering.04.

[5] Tuo Tao, Yuan Junyan (2018).Innovation and Demonstration of University Teacher Management Information System. Experiment Science and Technology.10.

[6] Wang Xinlei (2020).Research and Design of Intelligent Educational Administration System Based on ASP.NET. North China University of Science and Technology.06.

[7] Wu Xiaojing (2021). Design and Implementation of Experimental Teaching Management System in Higher Vocational Colleges Based on ASP.NET. Guizhou University.12.

[8] Xu Pingshun, Sun Shouqun, Yan Liang (2021). Design and Implementation of Pipeline Accident Management System Based on ASP.NET. Software Guide.04.

[9] Yang Chunlin (2022).Present Situation and Development Countermeasures of University Teachers' Management and Teaching Staff Construction. Journal of Hubei Open University.01.

[10] Yao Manhua, Xu Guorui, Wang Zhe (2022).Ways of Classified Management and Classified Development of College Teachers. University Education.02.