Design of Standardized Network Application Program for Financial Professional Course Guidance Based on B/S Architecture

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Abstract—In this paper, an online assistant system of traditional finance class with comprehensive functions and good performance is constructed. Under the Web technology system, it uses the full stack technology provided by Microsoft on the Windows platform, is written in C# language, introduces the ASP.NET framework to complete the three-tier structure, and chooses Visual Studio as the development tool. IIS is the core server to ensure its stability, and SQL Server database is used for data support, which involves a large number of data statistics, data mining and data analysis algorithms, and uses a large number of formulas, including functional linear regression model, decision tree algorithm, naive Bayes and so on. The system is equipped with two ports, namely, the student side and the teacher side, which can differentiate and simplify the functions, and build a standardized system for students' learning and teacher training. The system also provides a new model for the courses of finance major in colleges and universities, improves the actual efficiency of teaching in many ways, and contributes to the cultivation of financial professionals who meet the social requirements.

Keywords- Internet+education; Finance; B/S architecture; ASP.NET; method of weighting

1 FEASIBILITY ANALYSIS

1.1 Project background

Finance is the core of modern economy, the hub of social capital movement and an important lever for economic development. In recent years, as the largest developing economy, China's position in the international financial structure has improved significantly. China's financial industry presents new characteristics and development trend, which puts forward higher requirements for financial talents. Finance major in colleges and universities is an important channel for training financial talents, and it is responsible for providing talent support for China's financial industry. Colleges and universities pay more and more attention to the research and reform of finance courses, but there are still many problems in finance education and teaching. First of all, the curriculum content system of finance major is complex, and there

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are many related cross-disciplines, offline class hours are obviously insufficient. Secondly, teachers mostly use textbooks and courseware as the main teaching media, and the update speed lags behind the rapid development of the financial industry. In addition, the construction of professional teachers is backward, which leads to unsatisfactory teaching results. Thirdly, the teaching process is still teacher-centered, with oral teaching as the main teaching method. The classroom lacks originality and fun, students' subjectivity is not revealed, and their participation and enthusiasm are not high. In addition, finance is a highly practical major, and the course assessment methods are mainly based on the final closed-book examination. The content is mostly the memory of knowledge points, which lacks practical significance. All these problems eventually lead to the failure of college finance teaching to effectively match the needs of social posts, resulting in the disconnection between production and learning. [1]

Obviously, the traditional teaching methods can't meet the needs of finance courses, so colleges and universities must actively seek for changes, and promote the standardization of finance courses from the aspects of teaching content, teaching form, evaluation system, integration of production and education, etc. Among them, information reform is one of the important measures, which can effectively solve many problems existing in the teaching of finance major. Online teaching provides a new teaching mode for higher education. It sorts out and supplements the traditional classroom contents, makes the teaching media break through the boundaries of textbooks, and realizes the high integration and timely updating of online and offline teaching resources. While paying attention to the education of students, it should join the training of teachers, establish a high-quality and high-quality teaching team, and effectively integrate knowledge and practice to form the standardization of courses for finance majors. Therefore, the construction of "online+offline" teaching mode has become one of the important efforts of current college teaching reform.

To sum up, in view of the problems existing in the course teaching of finance major in colleges and universities at present, the author thinks that we should give full play to the advantages of network teaching and develop a standardized course guidance system for finance major. This system uses C# language for programming, ASP.NET framework for process building, and MySQL database for data storage and management. It has completed a set of standardized system of financial professional course guidance with simple operation, powerful functions and abundant resources.

1.2 Key technologies

1.2.1 Web: Web is a network service based on the Internet, which provides users with the required visual operation interface. The core component of Web is webpage, which can be divided into static and dynamic. Static webpages are presented in the form of text, pictures, videos and audio, while dynamic webpages can automatically generate new pages, which is convenient for users to call other Web applications through webpages. As far as current practical applications are concerned, most of them are web pages that combine dynamic and static.

Web development depends on the corresponding technical support. On the whole, Web application is divided into three parts: client browser, server-side business logic processing Web server and subsequent data storage database server. The whole Web application structure

and specific processing process adopt the "request/response" mode, that is, the user sends a request to the server through the client browser, and after the server gets the request, it controls and processes the business in time, completes the request response, and feeds the corresponding result back to the client. The Web workflow is shown in figure 1. [2]

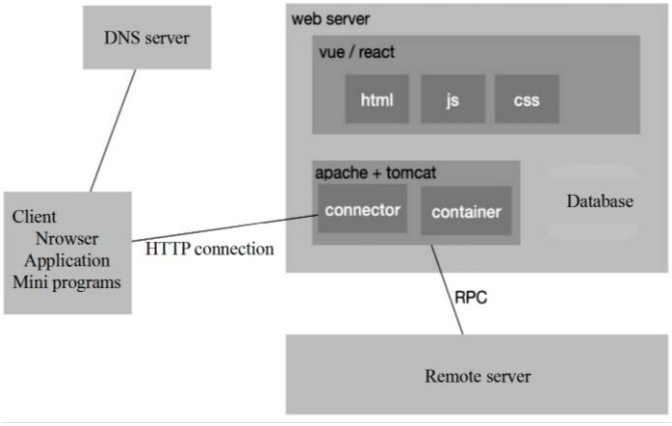

Figure 1. Web workflow flow chart

1.2.2 ASP.NET: .NET is a free and open source application development platform provided by Microsoft, including .NET core (cross-platform), .NET framework(windows) and Xamarin (Android) solutions. ASP.NET is an application development framework under .NET framework system. When ASP.NET framework is used, the back-end code is written in C#, F # or Visual Basic. As ASP.NET is an extension of .NET, you can use all .NET packages and libraries, and you can also create your own library. ASP.NET technology inherits the excellent hypertext transfer attribute of ASP technology, which can not only realize view design, but also be more stable and feasible than ASP technology. ASP.NET can build code of MVC mode, and avoid many duplicate codes, and only need to consume a small amount of hardware resources to achieve functional expansion. In addition, the development modes of ASP.NET include ASP.NET Web Form, ASP.NET MVC, ASP.NET Core. Developers can choose the development mode according to their own technical background and specific needs. [3]

1.2.3 C#: C# is an open-source, cross-platform, object-oriented programming language. It is the most popular. NET development language, and it is constantly adding new functional expansion. C# program consists of one or more files, each of which contains zero or more namespaces, and one namespace contains classes, structures, interfaces, enumerations, delegate types or other namespaces. Exception handling in C provides a structured and extensible method for error detection and recovery; Lambda expression supports function programming technology; Language integrated query (LINQ) syntax creates a common pattern for processing data from any source; Asynchronous operating language support provides syntax for building distributed systems. The powerful function of C# makes it the preferred language for developing large-scale applications. [4]

1.2.4 SQL Server: SQL Server is a kind of relational database management system, which is widely used. Its advantages mainly lie in its scalability (it is suitable for various platforms and

provides rich interfaces), integration (it provides the function of data warehouse and can be closely related to many server softwares), ease of use (graphical interface, more intuitive and concise) and high efficiency (it reduces the time and cost for users to manage data). Query storage is one of the most powerful features in SQL Server, which is used to troubleshoot performance and improve the stability of database workload. Query storage is often described as the "flight recorder" of SQLServer, which enables SQLServer to store query text, query plan and query performance history within the database scope. It gives a new method to troubleshoot and stabilize the database performance of applications without changing any line of application code or database compatibility level. [5]

1.2.5 Development process: According to the introduction of the above-mentioned related technical contents, the configuration and deployment of the development process of the Internet standardized system for financial professional course guidance are completed. The bottom development tool of this platform is Visual Studio 2019, and the operating system is based on Windows 10.0. Choose IIS version 10.0 for the web server to improve the operation ability of the server. Select SQL server 2019 as the data storage tool.

First, build the environment. ASP.NET needs to run in. NET environment, and the construction of. NET environment needs to download and install .NET SDK (software development kit) from Microsoft official website. Command: dotnet newwebapp-o mywebapp-no-https-fnet6.0 to create the program. After the program is created successfully, open the Index.cshtml file located in the Pages directory in any text editor, replace the code, save it and refresh it to create it successfully. Download official website C#, install it, configure the "name" variable, and then loop through all the "names" using foreach. The same is true for SQL Server, which is downloaded and installed in Microsoft official website. When the environment is ready, start creating the project.

The development tool uses Visual Studio 2019, creates a new project in the File part under the file, selects ASP.NET Web in the application, and then presets the configuration attributes and paths of the new project, then clicks Next, selects MVC in the pop-up working window and names it, and then the ASP.NET MVC project can be created for subsequent writing. Here, we will focus on the connection process between ASP.NET and SQL server. In Visual Studio, we will create a new empty website in ASP.NET, add a ListBox control, then split the control, select the data source SQL database, then "specify the ID for the database" to select the data connection, select the "data table" we built, and select "fields, columns and * signs represent all fields" in the data table. Finally, set the account password for "test query", and the whole system can be built after confirmation. The test code is shown in Figure 2. After the specific functional modules are configured, the simulation operation test is carried out. After the test, publish the generated website to IIS, then create a new website project in IIS, select the advanced settings in the Manage Website page, and select the physical path. After the basic configuration is completed, the platform can be built.

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Web;
using System.Data.SqlClient;

namespace request_response.App_Code
{
    public class DB
    {
        //Create a connection method
        public static SqlConnection sqlcon()
        {
        //This method of connecting to the database changes the way of
logging in to the database to SQL Server authentication
        //Server= "server name"; Database= "Name of the database to
connect to"
        //Uid= "login name"; Pwd= "password"
            return new SqlConnection("server=.\\mysql2008;database=
login;uid=sa;pwd=xu760309");
        }
    }
}
```

Figure 2. SQL server database connection test code

Through the description of the above key technologies, the overall framework is roughly planned, and the feasibility of establishing the standardized system of financial professional course guidance on the Internet is made clear.

2 FUNCTIONAL ANALYSIS AND DESIGN

The standardization system of financial course guidance is divided into two subsystems, namely, the student side and the teacher side. The functional design for different users is also different. The specific functional design is shown in Figure 3.

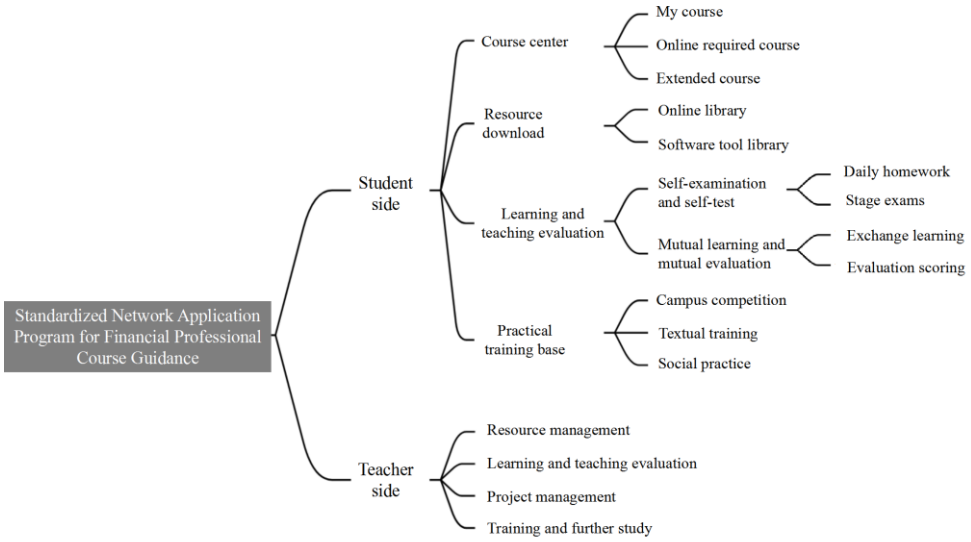

Figure 3. Functional structure diagram of standardized system for financial professional course guidance

2.1 Student side

Students click to enter the standardized system of course guidance for finance majors, click the "I am a student" button to enter the login page, and enter the correct account number and password in the input box. After successful login, students will see four page options in the top navigation bar: course center, resource download, learning and teaching evaluation and practical training base. The specific functional modules are as follows:

2.1.1 Course center: The "course center" page is mainly divided into three sections, from top to bottom: "my course", "online required course" and "extended course", with "my learning score" in the upper right corner. In "my courses", students can see their online courses and learning progress, which can be viewed online or offline after downloading. In the "online required courses", students can see the required courses of finance major arranged by the school, such as "Technical Analysis of Securities Investment", "Futures and Options" and "Guarantee Theory and Practice", which are used to overcome the problem of limited class hours of offline courses. Students can arrange the study time of required courses freely, and they can complete the course study if they meet the standard designed by teachers. "Extended course" is an elective course added according to the latest financial development. It is mainly to help students broaden their horizons and keep up with the times, such as "Internet Finance", "Cross-border E-commerce" and "Blockchain Finance". Students can study freely according to their own interests. [6] The "my learning score" in the upper right corner is designed to the preset algorithm of the system, and the formula is shown in Formula 1.

$$S=R+H+I \tag{1}$$

S (learning score), which measures students' utilization of the system.

R (learning progress) = video viewing time/total required course time.

H (study habit score) = regular study days× weight (regular study: study for 25 minutes or more every day)

I (interactive contribution) = effective questions (praised by classmates+praised by teachers)+effective answers (praised by classmates+praised by teachers)

2.1.2 Resource download: In the "resource download" page, there are two major sections: "online library" and "software tool library". In the "online library", students can check other electronic textbooks and related books to supplement the textbooks ordered by the school. The system integrates a large number of authoritative teaching materials and e-book resources, and updates them in real time according to the economic situation and policy changes. In addition to e-books, there are various forms of learning resources available for download, such as periodicals, newspapers, audio, video and courseware PPT. Finance is a very practical major, which requires a lot of computer operations and software applications. The "software tool library" provides a large number of downloads of open-source software or download links of open-source software that students majoring in finance can use, such as financial calculator, statistical software SAS, SPSS, business mathematical calculator Matlab, Mathematica, programming languages R, python, etc., and financial data analysis software Wind, Bloomberg. The download codes are shown in Figure 4. [7]

```
statusBar.Text = &amp;quot;Start downloading the app...&amp;quot;;
        client.DownloadFile(URLAddress,fileName);
        Stream str = client.OpenRead(URLAddress);
        StreamReader    reader = new StreamReader(str);
        byte[] mbyte = new byte[100000];
        int allmybyte = (int)mbyte.Length;
        int startmbyte = 0;
        statusBar.Text = &amp;quot;Receiving data...&amp;quot;;
        while(allmybyte&amp;gt;0)
        {
            int m = str.Read(mbyte,startmbyte,allmybyte);
            if(m==0)
                break;

            startmbyte+=m;
            allmybyte-=m;
        }
```

Figure 4. Software tool library application download code

2.1.3 Learning and teaching evaluation: There are two secondary page buttons in the sidebar of "learning and teaching evaluation" page, which are "self-examination and self-test" and "mutual learning and mutual evaluation". "Self-examination and self-test" mainly includes daily homework and stage exams. Students can check the corresponding homework and tests of their courses, including objective questions and subjective questions. After answering, the system will automatically give the scores, answers and analysis of objective questions, and the subjective questions will be uploaded to the teacher for review. The "mutual learning and

mutual evaluation" page is divided into two parts: exchange learning and evaluation scoring. The Exchange Learning Department has established an equal and open communication platform for all students and teachers in finance. Students can ask questions about finance to teachers, and teachers and students can discuss and learn together. The evaluation part constructs the evaluation system of students' mutual evaluation, teachers' mutual evaluation and students' evaluation of teaching. Students can evaluate each other and strengthen the authenticity and reliability of evaluation. You can also evaluate teachers, put forward opinions and suggestions on teaching work, and put forward your own ideas for teachers to improve teaching methods. [8] This module is designed with many calculation formulas. Here are the teacher grading algorithms, as shown in Formula 2.

Total teacher's score = student's score× 70%+

other teachers' score× 30% (2)

Among them, it is worth noting that in order to avoid malicious scoring, 5% of the highest score and 5% of the lowest score evaluation table are removed from the evaluation scores of students and other teachers.

2.1.4 Practical training base: The "practical training base" mainly aims at the problem that the traditional teaching mode emphasizes knowledge over practice, and mainly migrates the pre-work and follow-up work of practice to online. The "training base" is mainly divided into three sections: campus competition, textual training and social practice. "Campus competition" is an on-campus competition initiated by teachers. Practical products, such as business plans, technical documents of works and enterprise valuation reports, need to be submitted. Through rich competitions, learning can be promoted by competition, and students' learning enthusiasm and practical ability can be improved. "Textual training" includes a large number of courses related to financial textual research, both recorded by teachers of our school and online high-quality open classes, such as CPA (Certified Public Accountant), CFA (Chartered Financial Analyst), FRM (Financial Risk Manager) and ACCA ((The Association of Chartered Certified Accountants). Students who have spare time in learning are encouraged to obtain industry certificates to prepare for practical work in the future. [9] "Social practice" includes practical activities initiated by teachers, as well as practical activities carried out by students spontaneously forming groups. It can be the research and investigation of practical departments, or the internship of financial institutions, government departments, enterprises and institutions. Joining the practice activity will automatically join the activity chat group, and the group chat function code is shown in Figure 5.

```
<Window x:Class="TcpClient ChatWindow"
    xmIns='"http://schemas .microsoft com/winfx/2006/xam/presentation"
    xmIns x="http://schemas microsoft.com/winfx/2006/xaml"
    xmlns: d-="http://schemas .microsoft .com/expression/blend/2008"
    xmIns: mc="http://schemas openxmformats, org/markup-compatibility/2006"
    xmIns:local="cdr-namespace:TcpClient"
    mc:lgnorable="d"
    Title"Activity group chat" Height"450* Width="800">
  <Grid>
    <TextBlock HorizontalAlignment"Left' Height="23" Margin-"13,49,0,0"
TextWrapping="Wrap"  Text="Online users" VerticalAlignment="Top"  Width="150"
TextAlignment="Center' FontSize="18"/>
    <ListBox  Name="userList"  HorizontalAlignment="Left"  Height="323"
Margin=" 14,88,0,0"  VerticalAlignment="Top"  Width="150"  FontSize="18"/>
    <TextBlock  HorizontalAignment="Left"  Height="42"  Margin="350.24,0,0"
TextWrapping="Wrap" Text="Dialogue information" Verticalignment="Top"  Width="220"
RenderTransfomOrigin="0.288,0.171"  FontSize="30"  TextAlignment="Center"/>
    <ListBox  Name="mesList"  HorizontalAlignment="Left"  Height="271"
Margin="190,88,0,0"  VerticalAlignment="Top" Width="575"  FontSize="18"/>
    <TextBlock  HorizontalAlignment="Left"  Height="35"  Margin="190,375,0,0"
TextWrapping="Wrap" Text="speak:" VerticalAlignment="Top" Width="73" FontSize="18"/>
    <TextBox  Name="Message"  HorizontalAlignment="Lef"  Height="35"
Margin="283,375,0,0"  TextWrapping="Wrap" Text="VericalAlignment="Top" Width="357"
FontSize="18" />
    <Button Content"send"  Horiontlignent="Left"  Height="35"  Margin="679,375,0,0"
VericalAlignment="Top"  Width="71"
RenderTransfomOrigin="0.207,0.361"  FontSize="18" Click"Button Send"/>
```

Figure 5. Active group chat code (part)

2.2 Teacher side

Teachers enter the standardized system of course guidance for finance majors, and click the "I am a teacher" button to log in. After successful login, teachers will see four page options in the top navigation bar, namely, resource management, learning and teaching evaluation, project management and training and further study. The specific functional modules are as follows:

2.2.1 Resource management: On the page of resource management, teachers are responsible for uploading all kinds of resources. When uploading, they choose modules such as online required courses, extended courses, textual research training, online library and software tool library. Teachers need to manage these resources, including editing and deleting information.

2.2.2 Learning and teaching evaluation: In the "learning and teaching evaluation" page, teachers need to edit the homework and exam question bank, and issue the exam notice to grade the subjective questions. Teachers can communicate with students about their study situation in time, answer students' questions, evaluate students in their own classroom and evaluate other teachers. Teachers can also check other teachers' and students' comments on themselves and adjust their teaching plans in time. [10]

2.2.3 Project management: In the "project management" page, teachers need to upload information about competitions, practices and other activities, monitor the progress and

problems in time during the activities, check the works or reports submitted by students, and give their own opinions or suggestions.

2.2.4 Training and further study: In "training and further study", teachers can take part in all kinds of teacher training activities, which are aimed at financial professional knowledge and ability, as well as education and teaching ability. This function aims to strengthen the construction of teachers, so as to improve the teaching level of finance major.

3 SYSTEM TEST AND ANALYSIS

The author put the system into the finance major of our school for testing, analyzed the front-end operation fluency, system utilization, and the background operation architecture design, database design, code implementation and other aspects, and made some optimization of the system. The test results are shown in Table 1.

Table 1 Functional test results (part)

Test items	Test score (according to usage rate and BUG quantity)	Utilization rate (percentage)	BUG quantity	Result analysis
Extension class	66	63	1	The curriculum needs to be more attractive
Software tool library	63	77	4	System function still needs to be optimized
Self-examination and self-test	82	86	2	Need to enrich the question bank
Mutual learning and mutual evaluation	71	53	0	This function should be vigorously promoted

4 CONCLUSION

The standardized system of financial course guidance can play a very good supporting role in the traditional classroom of financial majors in colleges and universities, effectively increasing the class hours of finance and enabling students to learn more knowledge and skills. It integrates high-quality multimedia resources of the network, provides more opportunities for offline practice, and can help college students to master professional knowledge and improve their practical ability, so as to better connect with practical enterprises. This system innovates the teaching mode that students and teachers learn and make progress together, improves the actual effect of finance teaching in colleges and universities, and injects power into the development of China's financial industry. In the future exploration and research, we will continue to deepen the reform of the standardization system of course guidance for finance majors, so that the online finance can better serve the traditional classroom, cultivate more financial talents with solid professional knowledge and excellent professional skills, and make

contributions to the sustained and healthy development of China in the international financial market.

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