Construction of Enterprise Equity Incentive Management Platform Based on ASP.NET

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Abstract: The enterprise equity incentive management platform constructed in this paper is based on ASP.NET, and under the Web technology system, it uses Windows+C #+ASP. NET+Visual Studio+IIS+SQL Server technology stack provided by Microsoft to construct an equity incentive service scheme with comprehensive functions and good performance. Two ports, administrator port and employee port, are set up on the platform, and the administrators are managed by layers, so as to achieve comprehensive collaboration, information synchronization and real-time communication, which provides visual equity incentive data for enterprise managers and employees, so as to know equity information in real time, thus making reasonable decisions and making equity management more scientific.

1 INTRODUCTION

Equity incentive is to give some shares and options to core employees conditionally, so that employees can participate in decision-making, share profits and take risks, form a community of destiny with the company, and enhance employees' sense of belonging and cohesion. Equity incentive is adopted by more and more companies as a method to retain and motivate outstanding employees. However, at present, there are many difficulties in the implementation of equity incentive in enterprises. For employees, the relevant information is not open and transparent enough, so they can't see the current and future benefits intuitively, and they have doubts about the equity incentive plan. For the planning and implementation departments, the design of incentive plan, the division of incentive objects, the determination of total equity, the standard of business assessment, manual calculation and triviality are all great challenges. For the decision-making level, the report documents of each department are complex and unsynchronized, so the actual effect of equity incentive can't be seen directly.

According to the above problems, the author of this paper believes that it is necessary to design an enterprise equity incentive management platform with two ports, namely, administrator and employee, to migrate the work of equity granting, signing, maturity, exercise and trading online for standardization, and to complete the management of equity incentive in one stop, including incentive plan management, employee management, equity management, document management, visualization of company profile and business development. This platform can make equity incentive management bid farewell to manual calculation, become professional, simple and efficient, and ensure the maximization of incentive effect.

2 KEY TECHNOLOGIES

2.1 Web Technology

Web is a network service based on the Internet, which provides users with the required 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

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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 corresponding Web technologies are also divided into client-side development technology, server-side programming technology and database development technology, as shown in Figure 1. The client development technology needs to use HTML, CSS, JavaScript three development languages, and cooperate with the corresponding framework to complete the design and development of web pages. In the server-side technology, relying on powerful object-oriented programming languages such as Java, PHP and C# and the combination of various development frameworks (J2EE and ThinkPHP) can greatly simplify the development process of the server-side. And the data development technology needs the cooperation of database server. Most databases run on the client-server model. When users execute SQL statements in the data layer, the application will connect to the corresponding database server and send the SQL statements to the database server for processing. The database server parses the requested SQL statement. After the parsing is completed, the database server executes the SQL statement and returns the response required by the client. Common data servers are MySQL, Oracle, SQLServer, etc.

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.

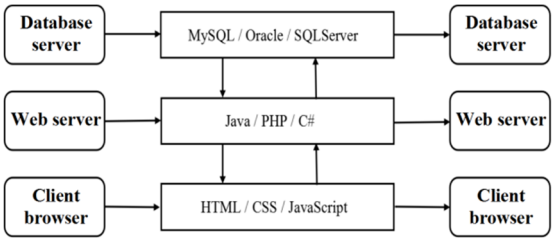

Figure 1: Technical structure diagram of Web development.

2.2 ASP.NET

.NET Microsoft provides a free and open source application development platform, including .NET core (cross-platform), .NET framework(windows) and Xamarin (Android) solutions. ASP.NET is an application development framework running on windows under .NET framework system, and provides a network template syntax for building dynamic web pages with C#, which is called Razor. When using ASP.NET backend code, it is written in C#, F # or Visual Basic. Because ASP.NET will extend .NET, it can use all .NET packages and libraries, and can also create its own library. ASP.NET technology inherits the excellent hypertext transfer web page attribute of ASP technology, which not only can realize single view design, but also is more stable and feasible than ASP technology. The advantage of ASP.NET operation mechanism is that it can avoid a lot of duplicate codes, and it can build MVC code. ASP.NET can be fully implemented, and can be flexibly arranged. It only needs to consume a small amount of hardware resources, and its function has strong scalability. 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. The running process of ASP is shown in Figure 2.

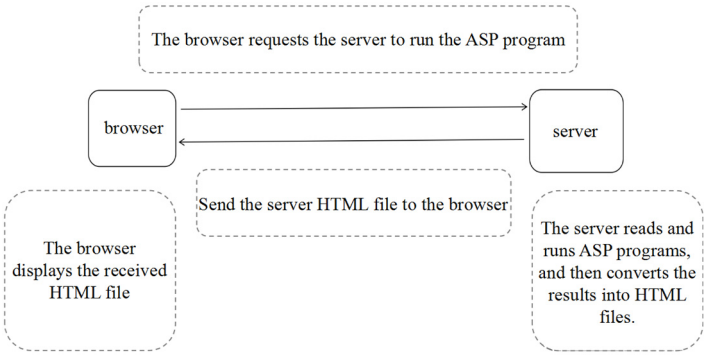

Figure 2: ASP operation process diagram.

2.3 C#

C# is an open-source, cross-platform, object-oriented programming language and the most popular .NET development language. C# program consists of one or more files. Each file contains zero or more namespaces. A namespace contains classes, structures, interfaces, enumerations, delegates and other types or other namespaces. At runtime, if a variable of reference type is declared, this variable will always contain the value null until the class instance is explicitly created by using the new operator, or until an object of compatible type that may have been created elsewhere is assigned to this variable. C# can be a null type to prevent variables that do not refer to allocated objects; Exception handling 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. (Li, Liu, 2022)

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 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. (Li, 2022)

2.5 Development Process

According to the introduction of the above related technical contents, we have completed the configuration and deployment of the development process of the enterprise equity incentive management platform. The bottom development tool of this platform is Visual Studio 2019, and the operating system is based on Windows 10.0. In terms of web server, IIS version 10.0 is selected to improve the operation capability of the server, and SQL server 2019 is selected 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. Enter the command dotnet new webapp -o MyWebApp --no-https -f net6.0 to create the program. After the program is created successfully, open the Index.cshtml file located in the Pages directory in any text editor. After code replacement, save and refresh it to create 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 of the system is Visual Studio 2019. Create a new required project in the File part under the file, select ASP.NET Web in the application, and then preset the configuration attributes and paths of the new project. Click Next, select MVC in the pop-up working window and name it, then you can create the ASP.NET MVC project for subsequent writing. After the specific functional modules are configured, the simulation test is carried out. Publish the generated website to IIS without error, 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.

Through the description of the above key technologies, we have roughly planned the overall framework, and made clear the feasibility of establishing the enterprise equity incentive management platform.

3 FUNCTION REALIZATION

3.1 Administrator Port

Administrators log in to the enterprise equity incentive management platform, and they will see two login ports: "administrator port" and "employee port". Click on the administrator port and enter the account number and password to enter the administrator platform. There are 8 sub-page buttons at the top of the homepage of the administrator, which

are: enterprise profile, plan management, equity management, employee management, transaction management, business report, document management and fiscal and tax management.

There are five columns in the "Enterprise Profile" page, which are basic information of the enterprise, equity penetration chart, shareholder shareholding ratio table, financial data table and company valuation. The data is provided and updated in real time by the enterprise credit reporting agency with official records. The system has no information modification authority, but only provides data display function, which can be used as a reference for operators to formulate and optimize equity incentive plans.

Click on the "Plan Management" page, and the administrator will see the list of incentive plans. Click to enter the details page, which is a dynamic pie chart, histogram, etc. automatically generated by the system according to the relevant reports of incentive plans uploaded by the administrator. The code for automatically generating statistical tables of data is shown in Figure 3. For example, the pie chart of options in the first incentive plan includes the total number of shares in option pool, the number of options granted and the number of restricted shares granted. Click "View Details" to view the details of equity.

```
/// <summary>
    /// Create a statistical graph
    /// </summary>
    private void CreateChart()
    {
        // TODO: Generate a statistical graph object
        Chart xlChart = (Chart)ThisWorkbook.Charts.
            Add(Type.Missing, xlSheet, Type.Missing, Type.Missing);

        // TODO: Set the data source
        Range cellRange = (Range)xlSheet.Cells[1, 1];

        // TODO: Generate Chart through wizard
        xlChart.ChartWizard(cellRange.CurrentRegion,
            XlChartType.xl3DColumn, Type.Missing,
            XlRowCol.xlColumns, 1, 0, true,
            "Option Awarded", "Month", "Total Option",
            "");

        // TODO: Set the name of statistical chart Sheet.
        xlChart.Name = "statistics";

        // TODO: Let 12 Bar show different colors
        ChartGroup grp = (ChartGroup)xlChart.ChartGroups(1);
        grp.GapWidth = 20;
        grp.VaryByCategories = true;

        // TODO: Make the display shape of Chart's entries cylindrical,
and add data labels to their display.
        Series s = (Series)grp.SeriesCollection(1);
        s.BarShape = XlBarShape.xlCylinder;
        s.HasDataLabels = true;
```

Figure 3: Data automatically transfer to statistical figure code (part).

On the "Equity Management" page, the administrator will see various current equity classifications of the company, such as options, restricted shares, virtual shares, and equity. Click on each equity page to view the list of holders, including the total number of grants, the mature number, the number of exercisable rights, the number of exercised rights, and the exercise unit price. All data systems automatically calculate, realize centralized database management, and import and export in batches. Visual management of equity, tracking key information such as equity holders' situation, equity signing status, equity transfer and holding agreements, making the equity structure and option issuance clear at a glance, making equity management efficient and convenient. (Hu, 2020)

On the "Employee Management" page, the administrator can see three lists of shareholders, core

employees and ordinary employees, which include information such as employee stock ownership, personal performance, team performance and seniority. Managers can intuitively see the performance of employees, so as to judge the equity incentive. Super administrators have all the permissions of the system, grant other people the identity of administrators, open different permissions to different administrators, and realize the authority grading of different levels of departments.

On the "Transaction Management" page, the administrator can see the situation of each transaction. Transactions are divided into grant, transfer, transaction, repurchase, etc. A series of reports related to the transaction support online one-click generation and batch downloading. It bid farewell to cumbersome processes and EXCEL which is difficult to maintain, automatically manage the maturity of options, and inform the company and employees in time. After the administrator reviews the exercise qualification, employees can exercise online. (Luo, 2018)

There are business reports submitted by various departments in the "Business Reports" page, including those of individuals, teams and companies. Here, the most important thing is to realize file synchronization and integration, with the code shown in Figure 4. The business is displayed by line chart, compared with the implementation process of equity incentive, and the actual effect of equity incentive is displayed intuitively.

```
/// <summary>
/// Recursive core, synchronous directory
/// </summary>
/// <param name="src">Original path</param>
/// <param name="obj">Target path</param>
static void loop(string src, string obj)        // Recursive core,
synchronous directory
{
    CopyFistly(src, obj);     //Synchronize files first

    //Traversing folders, recursively calling
    DirectoryInfo dirSrc = new DirectoryInfo(src);
    DirectoryInfo[] dirs = dirSrc.GetDirectories();
    foreach (DirectoryInfo dir in dirs)
    {
        string str = dir.Name;
        if (Directory.Exists(obj + "\\" + dir.Name) == false)
        {
            str = Directory.CreateDirectory(obj + "\\" +
dir.Name).ToString();
        }
        //Note here, this is recursion, and it's the place to
pay attention to below
        loop(src + "\\" + dir.ToString(), obj + "\\" + str);
    }
}
```

Figure 4: File synchronization code (part).

On the "Document Management" page, the system generates online agreement templates applicable to different employees, and offline signed grant agreements can be uploaded to the system, intelligently generating a complete set of high-quality legal documents related to equity, helping customers to manage legal documents efficiently and realize electronic management. In addition, the system supports the data archiving function, which greatly improves the efficiency of file preservation and sorting.

In the "Finance and Tax Management" page, the intelligent electronic tax calculation function can help managers efficiently solve the tax accounting and withholding problems of employees, and adjust the tax amount according to the specific situation.

3.2 Employee Port

There are four main functions of employee ports: enterprise profile, shareholding situation, online application and personal documents.

The "Enterprise Profile" page is the same as the administrator port. When employees log in to the personal platform, they can know the company's assets and operations at a glance, and decide their investment on this basis.

In "Shareholding Status", employees can check the equity held by themselves to show the information of their current options, including the total number of options, the number of exercisable rights, the number of exercised rights, mature plans and other information. The information of equity includes equity rights, total investment, holding methods, and the plan of releasing restrictions, which can intuitively see the value of incentives and maximize the incentive effect.

On the "Online Application" page, employees can directly submit the exercise and sale application through the platform during the window period, eliminating offline communication and paperwork, and directly submit the application online through one-stop operation, so that the corresponding transaction costs, taxes and profits can be displayed immediately. The system supports online signing, and employees can sign the grant agreement directly online. The system supports the signature of trace records in the background to ensure the compliance and validity of the signed agreement. When the individual option is mature and within the exercise window set when the incentive plan is established, the employee can apply for exercise, wait for the consent of the company, and visually check the current signing process and signing progress. (Cai, 2018)

In "Personal Documents", employees' personal documents are fully managed electronically. Employees no longer need to keep a large number of paper documents separately, and all document contracts can be stored electronically for easy viewing.

4 CONCLUSIONS

The enterprise equity incentive management platform based on ASP.NET has completed the whole process of equity incentive online, standardized the implementation process, reduced the workload and error rate of manual accounting, and solved many problems of equity incentive from planning to implementation. The data in the system equity incentive is changed from a large amount of EXCEL to a more intuitive statistical chart, which helps managers and employees of enterprises to make judgments quickly and accurately, helps enterprises to realize the incentive and retention of talents, and also encourages the long-term development of employees and the company to create greater value for the company. In the future practice, we will continue the research and implementation of enterprise equity incentive management platform to make equity management simple, scientific, convenient and visual.

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