Based on Ajax and jQuery Technology Web Application Development

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Keywords: Web, Ajax technology, Chart plugin, Calendar pidget.

Abstract. With the coming of the information age, a lot of information management system on reading speed data and interaction with customers has many places need to be improved. On the basis of Web application development, we research a number of technology, such as jQuery library, the chart plugin, the linkage menu and the calendar widget. This paper mainly describes the practical application of these plug-ins in Web application development. We can visualize the corresponding data, using the form of charts and calendar to display, and users can be very intuitive to see some information. The following is mainly about the research of these technologies and its implementation methods.

Introduction

For many traditional information management systems, it is necessary to improve the interaction with the user. This paper is to introduce some third party plug-ins and jQuery[1] these used together, in order to improve the information management system of user experience. In this paper, we use the third party plugins are fullcalendar calendar plug-ins and highcharts chart plug-ins, and then use the method of jQuery’s getJSON() for the fullcalendar calendar plug-in to provide display data. About the highcharts chart[2] plug-ins, we can click the chart control, then obtain the regional abscissa value as a parameter. According to these parameters, we can use the method of jQuery’s getJSON(), and the user can obtain more data faster. In the linkage menu, we use the Ajax technology to achieve the linkage of multiple drop-down menu. The Web application development framework using a three-tier architecture, the language used is C#, and the database is SQL Server 2008R2.

In this topic will relate to AJAX technology in the Web development process, for the requested data across the page, the most widely used method is jQuery’s getJSON() and Ajax. In this paper we will combine the actual situation, these two methods are introduced, and the problems that may be encountered and the solutions in this paper.

Three Level Menu Linkage

AJAX[3] is a Web application development method that uses client script to exchange data with Web server. In this way, the Web page can be dynamically updated without interrupting the interactive process. Using AJAX, the user can create near native desktop applications directly, high availability, more abundant, more dynamic web user interface. In this paper, the realization of the three level menu linkage and making the data refresh, the control is Extended AJAX controls CascadingDropDown cascading drop-down control.

First we need to configure ajaxToolkit, and download AjaxControlToolkit.dll, then refer to this control. We need to be configured in web. config and add some code. Adding a folder in the subject and is named dll, we need to put some control file associated with AJAX into this folder, namely AjaxControlToolkit.dll, AjaxMin.dll and so on. In this issue, the menu control using CascadingDropDown controls, in actual use, will configure some properties. The Table 1 is the configuration of the CascadingDropDown control properties for the city options.
Table 1. The Control’s Attribute.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Content</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>City</td>
<td>Corresponding to the classification of knowCategoryValues</td>
</tr>
<tr>
<td>LoadingText</td>
<td>Loading…</td>
<td>The message that is displayed when the dropdownlist control is being loaded</td>
</tr>
<tr>
<td>ParentControlID</td>
<td>ddlProvince</td>
<td>Select DropDownList from CategoryId</td>
</tr>
<tr>
<td>PromptText</td>
<td>city</td>
<td>Prompt text in the absence of selection</td>
</tr>
<tr>
<td>TargetControlID</td>
<td>ddlCity</td>
<td>CascadingDropDownNameValue should be loaded into the DropDownList control</td>
</tr>
<tr>
<td>ServicePath</td>
<td>AddressService.asmx</td>
<td>AddressService.asmx</td>
</tr>
<tr>
<td>ServiceMethod</td>
<td>GetCityContents</td>
<td>It is invoked to obtain the corresponding value of the Web method</td>
</tr>
</tbody>
</table>

On the named ServicePath Path page, write a method called ServiceMethod, The definition of this method is as follows.

```csharp
[WebMethod]
public CascadingDropDownNameValue[] GetCityContents(string knownCategoryValues, string category) {//Implementation of the method}
```

Category is defined in CascadingDropDown control value that will be included in the parameters knowCategoryValues. Then we can get selected provincesID, according to the provincialID as a condition to find city data, after the conversion of data formats, the CascadingDropDown control displays the data.

The Graphics Plug-in

We use the chart control which is Highcharts[4] in this topic, that is a pure JavaScript prepared by the graphics library and includes line, curve, regional, regional graphs, bar charts, bar charts, pie chart, map, angle measurement map, arrangement diagram, regional curve arrangement diagram, cylindrical arrangement diagram, polar coordinate map and other dozens of chart type. In this paper, we mainly focus on the column chart. First, we should define the bar graph styles in the `<head>`. Char is a chart area option, we introduce the type, and the type must set column. There are other options, such as title, subtitle, xAxis, yAxis, and series, in practice, Axis assignment is HomeAddressCountCategory and in the series there will be ordinate data HomeAddressCountData. The data need to define the format, then the data package together and is assigned to the front display.

**Highcharts Chart Controls Data Source Definition**

There are methods for achieving, we can make time as parameters, statistics of all sites during this time of performances, then choose the most performances of venues, Depending on the settings select venues. The venue is the horizontal, and the vertical axis is performance times, we use the Highcharts bar graph to display the data. X-coordinate data HomeAddressCountCategory is the venue name, and Ordinate data HomeAddressCountData that refers to a selected time, it is the number of performances of the site. It is important to note that we must distinguish different places with the same name of the venue, so we designed the abscissa axis name, such as” Xicheng District, Beijing: Mei Lanfang Grand Theatre”.

Expansion of the Graphics Plug-in

We combine the column with the method of jQuery’s getJSON(), And then when we click on a column chart, detailed information on the site during this period of time can be displayed on the web page, such as the time of the show, the play, the amount of money, etc.. There is a click event in the chart plugin
option series, which defines DynamicCreatePieChart(e. point. category, 0), the main function of this method is to get the detailed information of the column chart by using the data of the horizontal coordinate and the parameters of a symbol. The method of jQuery’s getJSON() is used in this function, the parameter to be passed which have the site information, start time and end time. According to the site information can be resolved into the area of the province, to distinguish the different place with the same named place. The Table 2 is a description of the parameters of the method of jQuery’s getJSON()

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>URL</td>
<td>Necessary: Which URL to send a request.</td>
</tr>
<tr>
<td>DATA</td>
<td>Optional. Together with the request to the server.</td>
</tr>
<tr>
<td>success(data,status,xhr)</td>
<td>Optional. The function that runs when the request is successful. Additional parameters: Response - contains the result data from the request Status - the state of the request Xhr-contains XMLHttpRequest objects</td>
</tr>
</tbody>
</table>

In practical applications, there are three parameters that need to be defined, provincecityAddress is a combination of the venue and its location, such as “the Xicheng District Beijing: Mei Lanfang grand theater”; startDate and enddate are the start time and deadline of a certain period of time; if the value of a is 1, it represents the site in the country, if its value is 0, it represents the site outside. According to the value of a, the method of province city address analysis is different. Because the provincial urban areas also have their own characteristics, so according to their characteristics to distinguish different venues, determine the location of the venues. According to these parameters, the data of performance information of the site at a certain period of time is finally obtained. In this paper, we choose the JSON, because in the foreground you can use table to display these specific data. JSON (JavaScript Object Notation) is a lightweight data interchange format, and it is readable and easy to have good characteristics of fast preparation. Fig. 1 shows the results we should implement in this chapter.

![Foreign performances analysis chart according to the site](image)

For XML and JSON these two kinds of data format[5], we choose JSON is a certain reason, As follows, we compare the XML and JSON. XML is a standard General Markup Language (SGML) subset, and is very suitable for Web transmission.
The Advantages and Disadvantages of XML. It is the format unified, standard. It is easy to interact with other systems. Data sharing more convenient. XML file is large, its file format is complex, and it demand of transmission bandwidth very heavy. The server and the client need to spend a lot of code to parse XML, causing the server and client code becomes very complex and difficult to maintain. The way of Parsing XML between client browsers is inconsistent, and write a lot of code to be repeated. The server and client parsing XML spend more resources and time.

The Advantages and Disadvantages of JSON. The data format is relatively simple, easy-to-read, occupying a small bandwidth and the format are compressed. It is easy to resolve, the client can simply read JSON data by JavaScript eval(). Because JSON format that can be used directly for the server-side code, greatly simplifying the code development, and easy to maintain. It belong to the primary stage currently in Service Web. XML format is more extensive than it.

Through the above description about the pros and cons of XML and JSON[6], finally, we combine the practical needs and considerations of the project performance, JSON data format is the best choice.

We encapsulate data into JSON format, and the package data back to the original page that save to result, and then in the method of jQuery’s getJSON() using JavaScript to write a table style in the div in order to display result data. The pseudo code for this module is as follows:

Begin
Bind data in the chart plugin
Do While(click on the monitor area of the chart plugin)
Call DynamicCreatePieChart(e. point. category, 0) method
If(result) then Using table to display the returned data
Else returns error information
End if
While End

Fullcalendar Calendar Widget

FullCalendar is a calendar plugin based on JQuery, it uses the method of getJSON() to read each month’s calendar events data. Fig.2 is a flow chart for the work calendar display.

From the Fig. 2 we can analyze the process that the data information is displayed on the calendar. In this article we obtain background data and transfer parameters by the method of jQuery's getJSON(). Use the script tag, by calling a specific src address to execute js function of a client. The server generates the corresponding data (JSON format), which passes to the client js function in the form of parameters and The system performs the function automatically. Provided that the server-side supports data output. JQuery 1.2 and above supports JSON applications.
Like Fullcalendar and JQuery, it is an object-oriented way to organize code. Of course, there is the so-called object-oriented that just only be the class as a whole Fullcalendar, This category includes many properties, methods, delegate (callback) as member variable. Calendar plug-in displays the data, we can get it through the method of jQuery's getJSON(), through this method, it can interact with the server and obtain the required data. JSON is now popular data interchange format in Web page, is widely used, both in jQuery and in Ajax can be seen in its shadow. FullCalendar supports JSON data source, and the background increases the JSON data interface. Although FullCalendar just be a show control, but it supports a number of callback operations, so we can use them to interactive data. In calendar.js we mainly use the method of $.getJSON() to read data from the background. The use of its benefits that can read data from different Web page. Of course, if we do not cross-domain, then we can use $.Post() to achieve it. The following is a set of code to display the calendar data sources.

```javascript
viewDisplay: function (view) {
    var viewStart = $.fullCalendar.formatDate(view.start, "yyyy-MM-dd");
    var viewEnd = $.fullCalendar.formatDate(view.end, "yyyy-MM-dd");
    $("#calendar").fullCalendar('removeEvents');
    $.getJSON("Json.aspx?Startdate=" + viewStart + ";Enddate=" + viewEnd + "&random=" + Math.random(), function (result) {
        for (var i = 0; i < result.length; i++) {
            var obj = new Object();
            obj.title = result[i].title;
            obj.state = result[i].state;
            obj.performanceID = result[i].performanceID;
            obj.start = result[i].start;
            obj.end = result[i].end;
            obj.content = result[i].content;
            var o_date = new Date(obj.start);
            var o_d = o_date.getDate();
            var o_m = o_date.getMonth();
            var o_y = o_date.getFullYear();
            obj.allDay = true;
            $("#calendar").fullCalendar('renderEvent', obj, true);
        }
    });
}
```

We can see that calendar plug-in displays the data which is provided Json.aspx from the above code. In the background processes need to pass the three parameters, which are Startdate, Enddate and random. Startdate and Enddate these two parameters are representative of the current month in calendar plug-in, if it is in November, so Startdate = '2015-11-01' and Enddate = '2015-12-01'. According to these two dates, we can read the data from the background by the month, so it will shorten waiting time for users. Json.aspx page provides JSON data for the calendar widget, while in Json.aspx page, according to these two parameters, we write a function that reads the performance information to the database in this month, and then packaged into JSON formatted data. When the organized data is returned, the data is stored in the result which is a defined data set, through the loop operation, the data will display in the calendar. In this topic, each performance can be set the different background color according to the different status, but these are not reflected in the above code. We can use the switch, according to the performance of different state we set different colors, such as
```
"case "completed": obj.backgroundColor =" #4d90fe "; obj.borderColor =" #4d90fe ";
```
, the code above is important because its main function is to redisplay the information in the calendar.
Conclusions

In this article, we always use the method of jQuery’s getJSON() to get JSON data. The plug-in is used to display data which the plug-in is the Highcharts chart and the calendar plug-ins. Now the requirements for information management systems become more sophisticated, users want to be responsive, experience of good information management system, and by using these plug-ins, you can make information management system to meet the many needs of the user to some extent. For these basic technology research, we can improve the efficiency of development, and make more data display with Plug-in unit and the web page can be more friendly.

Acknowledgement

The paper is supported by the National Cultural Science and Technology Promotion Program (Development and Application of Performance Group Operation Management Platform, 2015-09).

References