

## Research and Development of Web-based News Releasing System

ZHAO Qiao-fang

Department of Electrical and Mechanical Engineering  
North China Institute of Science and Technology  
Beijing, China  
zhaoqiaofang@ncist.edu.cn

LI Yong-fei

Department of Computer  
North China Institute of Science and Technology  
Beijing, China  
lyf518@ncist.edu.cn

**Abstract**—News Releasing System was a common web-based information release platform. A web-based news releasing system was developed with Java Web technology based on MVC design pattern, which included such functions as news displaying, news management and user management. And client-side programming technology, JavaBean and multi-tier design used for decoupling of code were analyzed.

**Keywords**—News releasing system, MVC, Client side programming, Multi-tier design

### I. INTRODUCTION

News Releasing System was a typical Web application, which had been widely used in information construction of various fields. For using the system as an information release platform, there were two types of user to involve: general news audience and news publisher, who was also the administrator of the system.

A News Releasing System with perfect functionality and fair well architecture was designed and implemented. Java Web technologies including JSP, Java Servlet, JDBC and Java Bean were used in developing. And MVC design pattern was employed for the system architecture.

### II. FUNCTIONS OF NEWS RELEASING SYSTEM

#### A. Function modules of News Releasing System

Fig.1 was function module diagram of News Releasing System. There were three modules, including news displaying, news management and user management.

#### B. Functions of News Releasing System

- News Displaying. The main function of news displaying was to display the news content, which achieved by two pages. One was the news listing

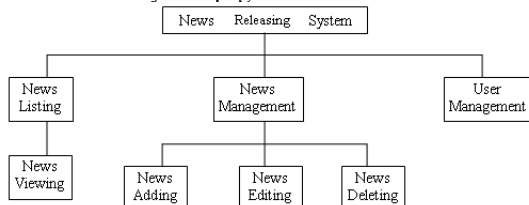


Figure 1. Function module diagram

page, which listing all the news title in the order of releasing time; and the other was news viewing page, which showing the detail of a news article when the news title in news listing was clicked.

- News Management. The main function of news management was to add, edit, and delete news content. And in order to support more rich news content, a picture file of specify format and an attachment file of any format were allowed in the news content except for plain text.
- User management. The previous two functions were the main part of the news releasing system. In addition, as news displaying was to be used by all users, while news management could only accessed by administrator, there should be login with correct user name and password before using the news management function. User management was used to manage the administrator's user name and password information, including adding, editing and deleting.

### III. DESIGN OF NEWS RELEASING SYSTEM

#### A. MVC Design Pattern

Pattern referred to a fixed solution for some problem abstracted from a recurring situation. Design pattern referred to the pattern used in software modeling and designing process [1]. It would contribute to achieve a high quality and more efficient software when developing the system with appropriate use of design patterns. MVC design pattern was currently governing architecture for building Web application. A Web application was divide into three parts, including Model, View and Controller, according to its different function for the purpose of minimizing the coupling between all objects constituting the system [2].

Model was the main part of an application, including the business data and business logic which implemented the system functions. When the model changed, the View would be notified and provided the ability to query the related state of model. Generally JavaBean was used as Model, which could be easily reused.

View was the user interface of an application, and responsible to obtain data from Model and show the data to user, and also accept user input data. There was not business processing in the View. In web application based on

request/response mode, View was in the browser side, and Model in the server side. Generally JSP was used as View.

Controller received request from the client and transferred the request into a certain behavior, which achieved by Model. After the behavior was completed, an appropriate View was selected by Controller to present the result data to the user, and fulfill the request.

The process of processing the request in MVC was as following: first, the user sent a request through the web browser; second, the Controller received the request, and passed it to the appropriate Model to do the business logic; third, the Model would address the result to the View in an appropriate way; fourth, the controller called the appropriate View JSP to show the result; fifth, the HTML document generated by JSP is returned to the browser as response, which presented the result to user. Fig. 2 was the structure of MVC Design Pattern [3].

### B. Architecture of News Releasing System

Fig. 3 was the architecture of news releasing system based on the MVC design pattern. In the figure, C meant Controller, implemented with Java Servlet; M meant Model, implemented with JavaBean LogicBean; and V meant View, implemented with JSP. Additionally, the DBBean encapsulated the operations to access database, and the DataBase provided storage for news data and user data.

The solid lines indicated control flow, and dashed lines for data flow when processing the user request in Fig. 3.

The detailed control flow was: the HTTP request from client-side was sent directly to the Controller Servlet. The Servlet called the appropriate Model LogicBean according to the service type parameter in the request to do required business logic. And then the request was forward to the appropriate View JSP page by the Servlet. Finally, JSP page generated HTTP response and return back to the client to complete the processing of a request.

In this process, the detailed data flow was: the controller would pass the HTTP request containing all the requested data to the corresponding method of LogicBean. In LogicBean, if database operations were needed, the SQL statement would be generated and passed to the methods of DBBean. Then the DBBean sent the SQL statement to the database. After execution, the result set is returned from Database to the DBBean, and them from DBBean to the LogicBean. In LogicBean, the records in result set were to be processed into data object, and put into a list, then list was put into a public storage space, typically HttpServletRequest object. Finally, JSP acquired the data object from list and presented it to user.

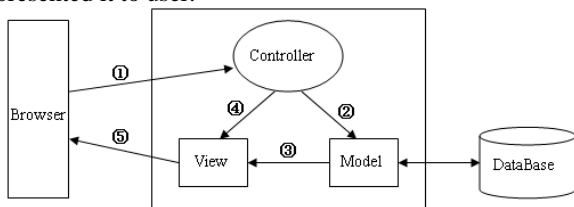


Figure 2. The structure of MVC design pattern

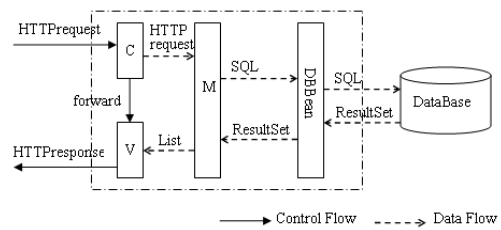


Figure 3. Architecture of news releasing system

## IV. KEY TECHNOLOGY IN IMPLEMENTATION OF NEWS RELEASING SYSTEM

There were several key issues to resolve in the implementation of news releasing system based on MVC architecture.

### A. to Restrict the File Format of Upload Image in Client Side

When news was published, an image could be uploaded to enrich the content of the news. But the file format of upload image could only be JPG or PNG considering the practical factors such as storage capacity. It was possible to restrict the file format by server-side program, but the burden on network transport would be increased. Here JavaScript code in client side was used to achieve the goal, which reduced the communication between client and server.

The sample code was as follows:

```

<script language="javascript">
function checkNewsForm(theForm){
    var picValue=theForm.pic.value;
    var
picForm=theForm.pic.value.substring((picValue.length-3),
    picValue.length);
    if ((picForm!="jpg")&&(picForm!="png")){
        alert("Only jpg and png format supported!");
        return false;
    }
}
</script>
...
<form          enctype="multipart/form-data"
action="newsCenter?action=add"
method="post"          onSubmit="return
checkNewsForm(this)">
...
    UPLOAD IMAGE: <input type="file" id="pic"
name="pic"/>
...
</form>

```

### B. to Encapsulate Database Record into Data Object for Data Transmission between Tiers

- As the View of MVC design pattern, JSP was only responsible for present data, and should not import java.sql package to access the database result set. So, data object NewsBean was defined to encapsulate

the record in the result set. Then each record in the result set corresponded to a data object, and all the objects were put into a list. By doing so, JSP was totally decoupled from database, and only treated with an ordinary object. It was illustrated in Fig. 4.

C. to Extract Code from JSP to Separate Processing and Display

In news listing page and news management page, it was necessary to display all the news title on the page. Apparently, it was too much to list all news title in one page because the total number of news would be hundreds or even more. Usually there would be a fixed number of news, for example 10, that be shown on one page. Then there should be processing code to decide which 10 news be shown on current page. As mentioned above, JSP was only responsible for present data, and there should not be too much code in the JSP to handle the problem. So a specialized JavaBean PageBean was developed, received the total number of news and the fixed number for one page and returned the related values about news for current page. It was also illustrated in Fig. 4.

D. to Decouple the Components of System by Multi-tiers Design

When designing the system, multi-tiers design was adopted to divide the whole system into four tiers, including interface tier, business tier, data access tier and data tier. The system was decoupled with multi-tiers design. If the business logic of system was more complex, there could be more tiers to further decouple the system [4]. For example, DAO pattern could be used in data access tier, which separated the method definition and method implementation with DAO

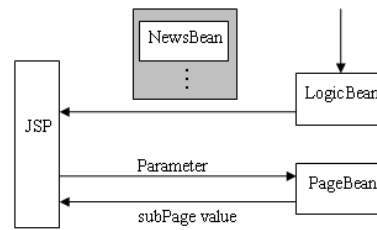


Figure 4. Data object and pageBean

interface and DAO implement class. And O-R mapping could be introduced into data tier to add a persistence tier, which completely isolated the java code from the interaction with the specific database, and enabled to use the database through pure object-oriented way.

V. SUMMARIES

News releasing system achieved such functions as news displaying, news management, and user management based on MVC design pattern and multi-tiers design, which would be helpful for information release.

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