

The Design and Implementation of the Online Shopping System for Digital Arts

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Abstract—In order to go shopping online more convenient, the design and implementation of the online shopping system based on JSP is presented in this paper. It mainly introduced the online shopping program, online payment, the order generating, and completed a series of functions about online shopping for Digital works.

Keywords : Web; Trade Online; JSP; Digital Arts

I. INTRODUCTION

Shopping online gradually becomes a kind of fashion with the prevalence of Internet and e-commerce. At the same time, as the development and the increasing integration of network and information technology, many traditional media contents tend to digital methods and it can be predicted that the digital mass media will be an alternative, which can be extensively used in e-commerce, such as online images, MP3's online sales, vigorous development of digital cinema, e-book sales and so on^[1]. In order to carry out online transactions of digital works, especially works as images, text, audio and video, we build an online shopping system in the application of JSP technology and MySQL database, which, achieved a series of functions of digital arts transaction, can help people in need search online, browse and purchase multi-media works.

II. SYSTEM DESIGN

A. Software configuration of Online Trading System

The system, as a typical Java Web Applications, has a three-layer software architecture. It is described a three-tier Web architecture development model using “JSP and JavaBean” technology, as shown in Fig. 1:

The client layer provides a browser-based user interface, on which Customers can browse the static or dynamic HTML pages which are passed over from the Web server, and users can also interact with Web Server through dynamic HTML pages. The web server provides an environment special for JSP

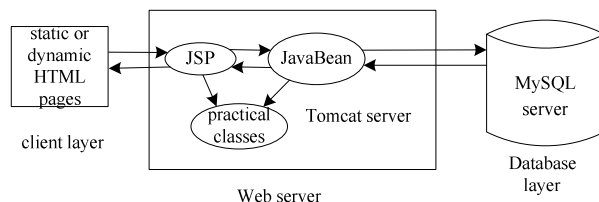


Fig. 1 Software Configuration of Online Trading System

and JavaBean and other components to run and visit. JSP is responsible for generating HTML pages dynamically, and at the mean time JavaBean is responsible for visiting the database and transaction. The database layer stores and maintains permanent business information in Web applications^[2].

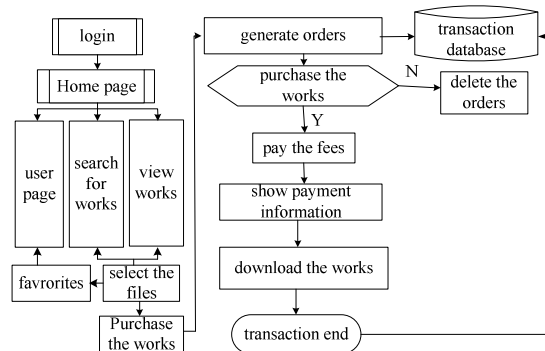


Fig. 2 The flow chart of online transactions

B. Workflow of Online Transaction

The flow chart of online transactions is shown in Fig. 2:

Customers can choose from favorites to purchase the digital works (including text, images, audio, video, etc.), so for their convenience, a back-end database on the server layer should be established to save the products information of the purchase. In order to solve this problem we use the JSP technology to send the information to the client's HTML pages. As soon as the purchase order is generated it will be processed to the actual bank through the online banking interface. And then after the order is written into the transaction database, it will provide users the permit of download it, and finally the trade is a success one.

C. The Analysis of System Function Modules

This system mainly includes the following features, which include the basic services that have been provided online in advance in the purpose that consumers can browse and purchase at any time to achieve an efficient online marketing approach. The online trading system function modules, as seen, can be divided into two categories: the front-end modules and the back-end modules.

On the one hand, the front-end modules include the search of works and query module, shopping cart module, front-end order processing module, and shopping management module.

On the other hand the back-end modules are related to the items of works information management module, back-end order management module, and back-end user information management module. The functions of main modules are as follows:

1) *works' search and query module*

The module provides users with functions of a quick query for the required digital works and the relevant information of the works, such as the authors, the content profiles, and the addition time through which consumers can make reasonable and satisfactory choices.

2) *shopping cart and order processing front-end modules*

The modules provide the functions of saving the information of the selected goods in the shopping cart, and generating relevant orders when consumers browse and choose the arts that they want to buy. The modules will provide the following specific sub-functions:

- Consumer can view the shopping cart's order status at any time as long as they stay online;
- Consumers can fill in the online orders, and change them when they think it is necessary.

3) *back-end works information management module*

In order to ensure the timeliness of the information of the online works, the module, will allow back-end maintenance and management staffs to add, delete and modify the online sales of digital works at any time. The module can provide the following specific sub-functions:

- provide classification of works management;
- provide work-related information management.

4) *back-end user information management module*

Back-end user information management module is used to implement the web site maintenance and management of back-end user status, such as the managements of user bind information and authentication, etc.

III. System Design and Implementation

A. System Database Design

The system consists of six tables, namely, the works' basic information table, the basic information table of works categories, the users' basic information table, order form, order list table, and the basic information table of the system administrator. We can establish the relationship based on the link of the related fields between the tables [3]. And the correlation between the tables is shown in Fig. 3:

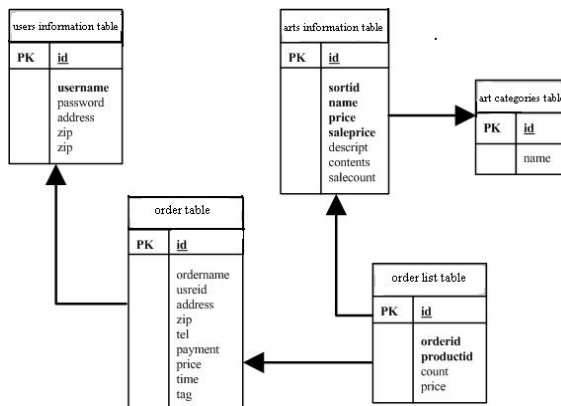


Fig. 3 the correlation between the tables

The id of works' basic information table is correlated with the id of works categories, order form's id is correlated with the id of the order list table, and the product id of order list table is associated with the id of works' basic information table [4]. The following table lists only the basic structure of works' basic information table which is shown in Table 1:

TABLE 1 WORKS' BASIC INFORMATION TABLE

fieldname	description	type	length	null or not
id	works id	INTEGER		no
sortid	sort of works id	INTEGER		no
name	works name	VARCHAR	50	no
price	works price	DOUBLE		no
saleprice	sales price	DOUBLE		no
descript	worksdescription	TEXT	400	no
contents	works content	TEXT	1000	yes
salecount	sales volume	INTEGER		yes

Database tables can be created in the MySQL database after having determined the structures of them, and the SQL scripts of the database tables[5] are given as follows:

```

CREATE TABLE product (
id INTEGER PRIMARY KEY,
sortid INTEGER NOT NULL
REFERENCES sort (id) ON DELETE CASCADE
name VARCHAR (50) NOT NULL
price DOUBLE NOT NULL
saleprice DOUBLE NOT NULL
descript TEXT (400) NOT NULL
contents TEXT (1000) NULL
salecount INTEGER NULL
)
  
```

B. Programming and Implementation

Tomcat is selected as the server in the system, and MySQL is the database server using Eclipse as an integrated development environment. We choose JSP technologies in the programming. The system consists of a large number of files, such as online trading system home page (index.jsp), registration page (login.jsp), favorites page (favorites.jsp), arts details page (details.jsp), shopping cart information page (basket.jsp), online payment page (cashier.jsp), orders generation pages (orderdisplay.jsp) and so on. In the aspect of the document organization, we organize files into system directory trees to follow the principles of web design.

JSP is focused on generated dynamic pages, while JavaBean is to complete the transaction through which we can take full advantage of the reusability of the software components, and improve the efficiency of the development of website [6]. Take purchasing e-books for example, we will explain the implementation of generating orders and orders for storage. When consumers go to the purchase page to check out relevant information about works they can click on to confirm the purchase of the kind of e-books. At this point if consumers want to buy other works they do not have to rush to pay; they can return the previous page, click here to continue to browse

other works. Consumers can always click to view their shopping cart items to confirm or delete their own works they do not want to purchase. When the confirmed message comes in the shopping cart, the order will be stored in the transaction database. After the consumer clicks on the page to confirm the trade, the page provides users the function to download the works that they have purchased. At this point, transaction information is in storage. The transaction is completed successfully.

The following is part of CreateOrderAction.java file of JavaBean components which is responsible of dealing with the request of generating orders, and the main codes are as follows:

```
package cn.com.shoppingonline;
.....
public final class CreateOrderAction extends Action {
    public ActionForward execute (.....) throws
    Exception{
        DynaActionForm orderForm =
            (DynaActionForm) form;
        .....
        Membermember = (Member) session.getAttribute
            (Constants.LOGIN_USER_KEY);

        /* determine whether the user login* /
        if (member == null) {
            errors.add(ActionMessages.GLOBAL_MESSAGE,new
                ActionMessage ( "errors.userUnLogin"));
            if (! errors.isEmpty ()) {
                saveErrors (request, errors);
            }
            return mapping.findForward ( "toWrong");

            /* determine whether the shopping cart is empty * /
        else if (shopCartList == null || shopCartList.size () == 0) {
            errors.add(ActionMessages.GLOBAL_MESSAGE,
                new ActionMessage ( "errors.nullShopCart"));
            if (! errors.isEmpty ()) {
                saveErrors (request, errors);
            }
            PageForward = "toWrong";
        }
        else{
            // complete database-related operations
            DbOperate db = new DbOperate ();
            Order order = new Order ();

            /* Save the Order * /
            SimpleDateFormat df = new SimpleDateFormat (
                "MMddhhmmss");
            String orderno = member.getUsername () +
                df.format (new Date ());

            // order number is generated
            order.setOrderno(orderno);
            order.setUserid (member.getId ());
```

```
.....
        /* modify the number of goods sold * /
        shopCart.getProduct (). setSalecount (shopCart.getProduct
            (). getSalecount () + shopCart.getCount ());
        db.update (shopCart.getProduct ());
        totalPrice = totalPrice + shopCart.getPrice ();
        }
        .....
        return
            (mapping.findForward (PageForward));
    }
}
```

IV. ACKNOWLEDGEMENT

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V. CONCLUSION

Buyers and sellers can get together through the online trading space, and in that way we can enjoy more and more convenient business services. On-line trading system provides basic purchase service for digital works so that consumers can browse and purchase at any time to achieve an efficient online marketing approach. In this paper, on-line purchasing module has basically completed all the required features, and consumers can easily navigate to the various works hits, get a convenient and quick understanding about work-related information and make a purchase. However, we also need to improve in some areas, such as the module's security features, the lack of corresponding data encryption, and when transaction payments should be involved; you can try to take other payment method such as PayPal and other forms of payment. These functions will be discussed separately in later research.

VI. REFERENCE

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