Design and Implementation of E-commerce Platform based on Vue.js and MySQL

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Abstract. Information technology is changing with each passing day, and the demand for e-commerce platform is also growing. It is of great research value to develop an efficient and high-quality e-commerce platform system. This project is based on the mainstream and latest front-end development framework Vue.js to build the front-end part of the technology development platform. The back-end uses the mainstream framework of Java SSM and MySQL database for design and implementation. The system enables operators to better manage and maintain their own platform, which brings great convenience to businesses and users.

Keywords: Vue.js MySQL, e-commerce, electrical component selection.

1. Background

In the era of network information, information technology is widely used in all walks of life, and e-commerce websites have become an important sales channel. The construction of e-commerce website not only realizes service informationization, but also opens up network transaction and payment functions, which facilitates people's daily work and life while improving service quality.

Many people who mention online shopping immediately think of mainstream e-commerce platforms such as Taobao, Tmall, and Jingdong. Many brands, various corporate stores, and official flagship stores want to share a "flow" on the big platform. In addition to relying on large e-commerce platforms such as Tmall and Jingdong, more and more businesses are starting to build suitable online stores for their products, thus creating a more convenient shopping platform for their accumulated customer base.

Technology has changed lives, and e-commerce sites have become the most direct carrier of this change. How to develop websites efficiently and quickly becomes the key to success for the company. Since the e-commerce business carried out on the Internet is not the same, each e-commerce website has different implementation functions. This project is built on the e-commerce platform for the selection of electrical components. The following picture shows the website login interface.

Fig. 1 System login interface

2. Main Technical Introduction

2.1 Vue.js.

The traditional development method mixes the front-end code and the back-end code, such as ASP, JSP technology, etc. This development mode needs to be interspersed in the front end and the back end, resulting in poor readability of the code and low development efficiency. In view of the above reasons, the development structure of the separation of the front and rear ends was born.

This project adopts the front-end part of Vue.js technology development platform based on mainstream and latest front-end development framework, which improves the development efficiency of the website, clearer code logic, easier to cope with the changing needs, and the system is easier to maintain and integrate so as to reduce development costs.

2.2 Java SSM Framework.

SSM, the integration framework of the three open source frameworks of the Spring+ SpringMVC +MyBatis.

SSM is often used as a framework for simpler Web projects for data sources. Spring is a lightweight control inversion (IoC) and aspect-oriented (AOP) container framework. SpringMVC separates the roles of controllers, model objects, dispatchers, and handler objects, making this easier to customize. MyBatis is an excellent persistence layer framework that supports common SQL queries, stored procedures and advanced mapping.

2.3 MySQL

MySQL is one of the most popular relational open source database management systems. It saves data in different tables and is fast and flexible. The system uses MySQL to realize the functions of storing, modifying, deleting and querying data, which enables more systematic and scientific management of data.

The front desk and the back office are two aspects of system design: the buyer corresponds to the front desk design, and the background corresponds to the system user. The front desk of the system can realize online shopping for users, and the front desk provides users with functions such as dynamic browsing, information viewing, user registration, login, online ordering, shopping cart and the like. The administrator privileges include data maintenance, order processing, product information management, and the more. Through the development of the background, the electrical components products are effectively displayed on the website. The front-end, back-end and database form a complete e-commerce website. The structure of the website is shown in Figure 2.
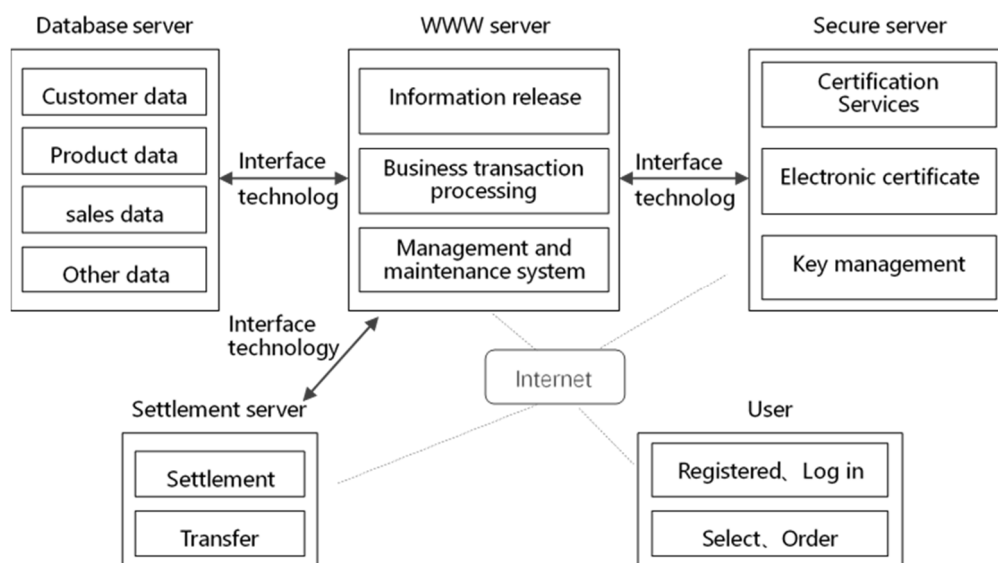

Fig. 2 Website structure

3. System Function Module Design and Implementation

According to the demand, the e-commerce website for selecting electrical components can be divided into several main functional modules such as user management, component background maintenance, component ordering, and online payment, as shown in Figure 3.
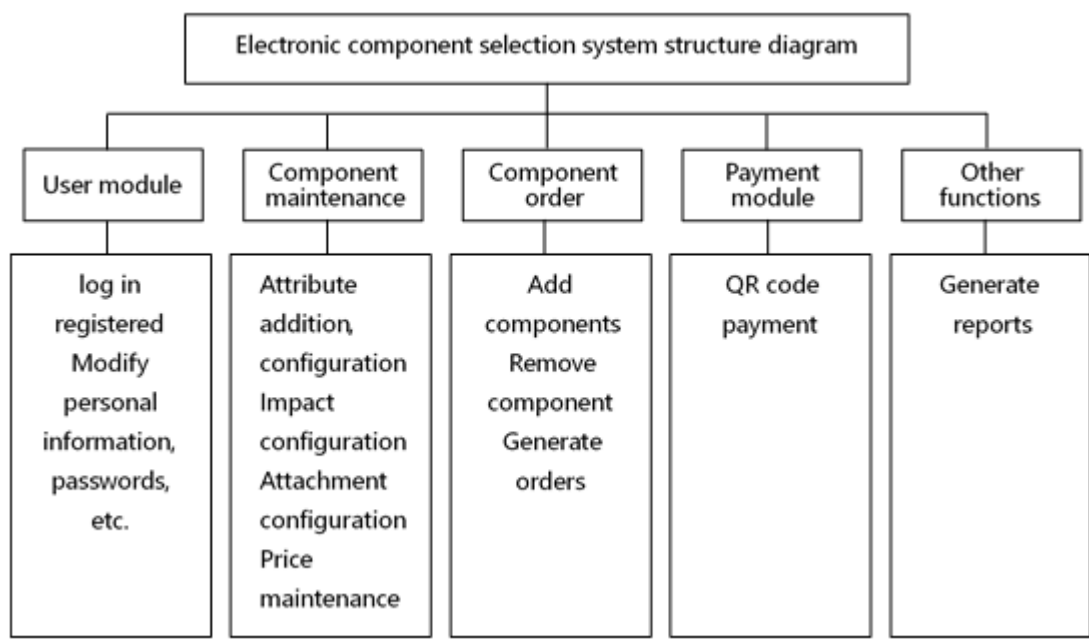

Fig. 3 System function module

3.1 User Module

The user management module mainly includes functions such as member registration, login, member personal data management, and member history information management. In the process of managing personal related materials, historical information, and online messages, the system needs to ensure the security of the member's personal information.

3.2 Component Maintenance

There are many kinds of products in the enterprise. The website uses the database to provide accurate and fast information searching and querying services for the viewers, so that the customers can easily and quickly find the required information in the e-commerce database. This is a function that reflects the ability of the website to organize the information and expand the way information is exchanged and delivered.

3.3 Component Order

When a user finds an item of interest, clicking on the item will display descriptive information such as the text, image, and attributes of the item. Users can also click on an attribute at will, and the parameters below the item will be updated accordingly, which is also a highlight of the project. There are many secondary functions in the management of the shopping cart, such as modifying, deleting, adding and other related functions in the shopping cart order. When the user wants to purchase, the product can be put into the shopping cart. When the customer fills out the order form, the system will reply the confirmation information sheet to ensure the receipt of the order information. Figure 4 below shows the product attributes and ordering interface.
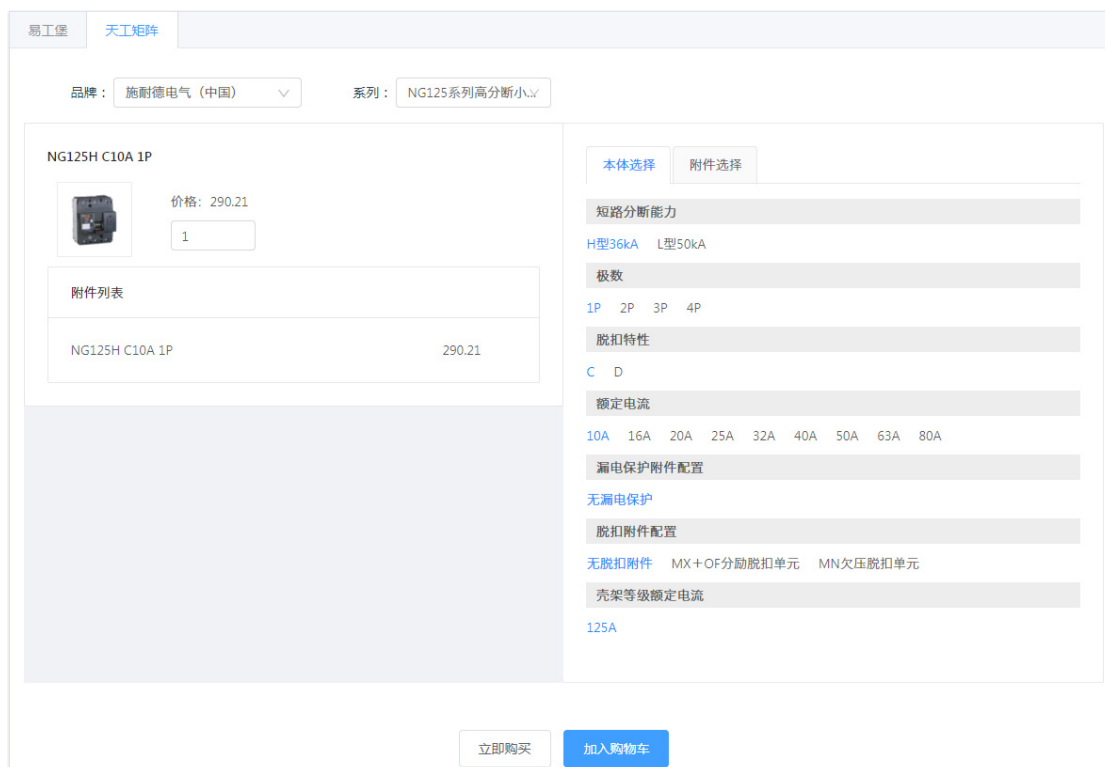
Fig. 4 Product attributes and ordering interface

3.4 Payment Module

In addition to the transactions, online payment is also an important part. The direct use of the electronic payment methods on the Internet makes online shopping more convenient, and makes e-commerce a complete process. Online payment must be supported by e-finance, that is, financial institutions such as banks or credit card companies must provide online operations for the financial services.

3.5 Other Functions

Customer information management is an important value-added function that reflects whether the main body of the website can be customer-centric and can fully utilize the customer information to tap the market potential. Successful websites must be interactive and interactive. Companies can use the website to collect information and then give managers decision support based on the results of these data analysis.

4. Innovation

4.1 Longitudinal Data Storage

The maintenance of product information is one of the important functions of the background. The electrical components have large amount of data, many attributes, and many interactions between attributes. The traditional horizontal database design is difficult to meet the parameters in the database application system. Therefore, we use vertical storage in the database in order to better adapt to the changes of the attributes of the components.

Fig. 5 Table structure window

4.2 Binary Tree Traversal

The influence between component parameters is very complicated. One parameter of the upper layer affects the parameters of the lower layer, and sometimes multiple parameters affect the parameters of the lower layer. In order to achieve such changes, we use the traversal of the binary tree to complete the effects between the parameters.

Fig. 6 Parameter settings

Fig. 7 Parameter management window

```java
@RequestMapping(value = "/addCompParam.action",method = RequestMethod.POST,produces
= "application/json")
@ResponseBody
public JSONObject addCompParam(CompParam compParam){
    JSONObject ret =new JSONObject();
    try {
        String beforeId= compParam.getBeforeId();
        CompParam afterId= compParamService.getAfterId(beforeId);
        if(null==afterId){
            compParam.setCreateDate(MyDateUtils.getDate("yyyy-MM-dd HH:mm:ss"));
            String userId = ShiroUtils.getUserId();
            compParam.setUserId(userId);
            compParamService.addEntity(compParam);
            ret.put(Constant.RTN_CODE, Constant.SUCC_CODE);
            ret.put(Constant.RTN_MSG, Constant.SUCC_MSG);
        }else {
            ret.put(Constant.RTN_CODE, Constant.DEFAULT_ERROR_CODE);
            ret.put(Constant.RTN_MSG, " This parameter is configured!!!");          }
    } catch (Exception e) {
        e.printStackTrace();
        ret.put(Constant.RTN_CODE, Constant.DEFAULT_EXCEPTION_CODE);
        ret.put(Constant.RTN_MSG, Constant.DEFAULT_EXCEPTION_MSG);
    }
    return ret;
}
```

5. Conclusion

With the gradual development and popularization of network information technology, enterprises have realized the importance of using the Internet for brand building and market expansion. Internet consumption has become the main battlefield of network marketing, and the high-quality network marketing will bring more benefits to the company. The functions of e-commerce websites have the same goal. They make full use of the advantages of wide-ranging information dissemination and fast dissemination of Internet information, expand offline transactions, and establish online display and trading platforms. The selection of electronic components for e-commerce has reduced costs and increased sales. The website is running fast and it is easy to manage, and the system has improved the experience of operators, merchants and users. The method used in establishing the table structure is not simple enough, and the further research and optimization are needed.

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