



Research Article

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## Design and implementation of pharmaceutical enterprise management system based on JavaEE

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### ABSTRACT

*Pharmaceutical enterprise management system based on JavaEE can as work platform, enterprise management personnel in a timely manner to provide pharmaceutical companies operating in the process of all kinds of information, improve managers in the management of user efficiency and level of employment, with strong adaptability and practicability. Based on the JavaEE pharmaceutical enterprise management system design and implementation of this paper discusses the principle and structure of the system, proved that the optimal management system with flexible mechanism, high safety, easy to extend.*

**Key words:** Pharmaceutical; Flexible mechanism; Enterprise management; JavaEE

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### INTRODUCTION

Our country medicine circulation industry there are many different kinds of drugs and drug demand uncertainty, the validity of drugs must be strictly controlled, and special drug sales model, process complex business. Traditional medicine industry circulation process, information circulation, procurement process specification, material inventory control difficulties, drug distribution costs is high, caused the high drug prices, lack of market competitiveness.

Pharmaceutical companies into the remaining pin system aims to the existing medical resources rational allocation, use of scientific management and optimization method and technology, optimize medical circulation process, use medicine circulation enterprises have some facilities, warehouses, transport vehicles, equipment, facilities, and apply information technology to traditional medicine circulation enterprises logistics system reform and innovation, the development of modern medicine into the pin mode. So as to establish a perfect and efficient computer information management system, can make the enterprise reduce redundant inventory, reduce operating costs, reduce the cycle of the business, to ensure on time delivery, improve product quality and the enterprise strain capacity and so on, and then improve the pharmaceutical sales enterprise's management level and economic benefits[1][2][3][4].

Pharmaceutical sales enterprise informatization management problems, the author of this paper, the container model based on component JavaEE platform [5], designed and implemented pharmaceutical enterprise into a sales management system. This system not only has the optimization of flexible management mechanism, and has strong portability, the advantages of high safety, more easily to extend.

### JAVAEE PLATFORM AND THE MVC PATTERN

Drug management system need to be able to gradual expanding evolution, to meet the market needs and business requirements, and maximum keep the function of the existing software, reducing the workload of iterative development. JavaEE for the development of high scalability, high flexibility and easy maintenance of drug sales management system provides a good mechanism;JavaEE has the following three advantages:

Development of fast and efficient: software middleware vendors can according to develop some JavaEE

specification is very cumbersome and general server-side program, developers only need to directly use in the process of development, can focus on business logic, save a lot of development time, improve the development efficiency.

Strong portability: based on the JavaEE procedures do not rely on the operating system and hardware, the need to develop a can be deployed on different platforms. If necessary can also be customized components in conformity with the JavaEE standard provided by a third party, the deployment into the system, reduce the cost required to produce the overall solution.

Low coupling and high flexible: application system based on JavaEE system structure, reasonable use of effective design patterns to reduce the coupling between the components and levels, make the individual components and levels remain relatively independent, in a form when a change is needed, the system.

MVC (Model View Controller) is a kind of software architecture Model in software engineering, the software system is divided into three basic parts: Model, View and Controller. VC model aims to implement a dynamic programming, make the follow-up of process modification and extension of simplification, and make possible the repeated use of one part of the program. In addition, this pattern through simplifying the complexity of the program structure more intuitive. Software system based on its basic parts of separation at the same time also gives each basic function. The overall effect of the MVC pattern can be as shown figure 1.

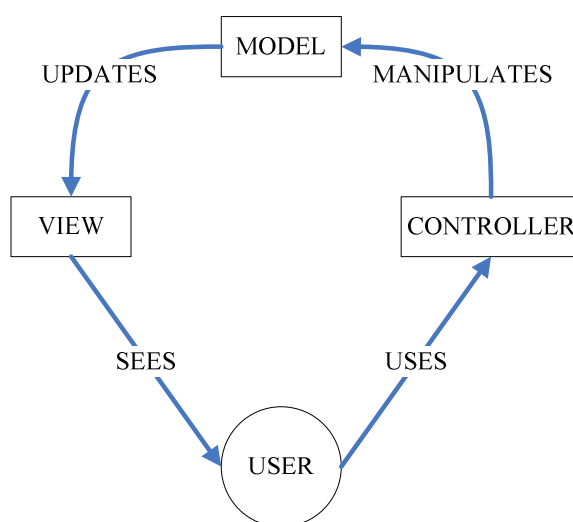


Fig.1 MVC component figure of cooperation

Model: model is the state of the business processes and business processing and business rules, business process of process is black-box operation, for other layer Model accept view request data, and return the final processing result. Business model is the core of the MVC design, business model and it is a very important model data model, data model refers to the entity object data (persistence), such as a data saved to the database, the model can be listed separately, all concerning the operation of the database only limit in the model.

View: view on behalf of the user interface, typical View technologies include: JSP technology, static HTML pages, containing Ajax framework of dynamic page technology and some statements, etc., View technology is mainly responsible for data input and output.

Controller: controller can rise to control the whole business process through the control layer and implement Model and the View to work together, doesn't do any of the data processing control layer. Therefore, a model may correspond to multiple views; one view may correspond to multiple models.

As can be seen from Figure 1, coal miners are highly consistent with each other in their views on whether they will take the initiative to stop unsafe behaviors of others. 38 % of respondents strongly agree with the statement that they should stop unsafe behaviors of others; 57% of them agree with it; only 3% of them disagree with this statement. Thus it can be seen that almost all coals would take the initiative to stop unsafe behaviors of others.

## PHARMACEUTICAL ENTERPRISE MANAGEMENT SYSTEM DESIGN

### 1. System design goal

Pharmaceutical companies into the sales system design is the purpose of the introduction of advanced information management for the enterprise idea, strengthen the control of the whole sales process management. Main objectives are:

Through the internal management of the informatization construction, accelerate the logistics delivery, increasing the ability of effective use of funds to purchase information, inventory information, sales information, a comprehensive dynamic monitoring and management, to achieve something in the company within the scope of the reasonable use, reduce the capital turnover time, reduce redundant inventory, reduce the cost of sales, etc.

Through the real-time detection and purchasing process of real time sales information collection, dynamic analysis and projections for procurement and sales, the enhancement enterprise internal business each link of the strain capacity, to ensure the high quality and high benefit of the whole sales process.

To track the sales order as the main line, according to the demand of sales order organization procurement, inventory, sales organization, improve the order of exchange rates, to speed up the market reaction speed, the maximum to meet customer demand.

### 2. System function template

The idea of modular design, around the drug sales enterprise business process and the actual situation, the development of drug sales management system, from the function mainly include drugs market management, sales management, drug storehouse management.

Drug procurement management: this module is mainly used to manage some of the pharmaceutical market operation. Respectively for supplier information to add and delete; Add and delete of drug information; Purchase order of the query function; Purchasing plan management increase and delete functions.

Drug warehouse management: this module is mainly used for drug management in and out of the warehouse. With warehouse management, inventory management and warehouse management. After the drug storage, and increase the quantity of the drug in the inventory, and query of storing records; Record all the drugs in quantity in stock. After the drug delivery, reduce the amount of the drug in the inventory, as well as to the outbound records of the query.

Drug sales management: this module is mainly used to manage the sales of the drug. Information for the customer to add and delete respectively; Manage customer order of drug prices, so that the company sales department query; Management needed medicines quotation to customers, and as a reference price of the drug after sales; Manage customer order, after the drug sales automatically reduce the amount of the drug in the warehouse; Generation and management of drug demand list, when the customer needed no drugs in the inventory, the needs to generate drug demand list for purchasing department to purchase.

## PHARMACEUTICAL ENTERPRISE MANAGEMENT SYSTEM IMPLEMENTATION

This system adopts the concept of network resource management system, build the enters sells saves the management as the main body of the software platform. Combined with three kinds of framework (persistence layer using Hibernate framework, the presentation layer USES the Struts framework, business logic layer using the Spring framework) to build the drug sales management system architecture. These three frameworks for each different layer of Web applications, each layer in the application has a clear responsibility, and each layer is independent each other, but open to other application layer communication interface.

The following orders, for example respectively introduces the three frameworks in the application layer.

### 1. The realization of the persistence layer

Hibernate framework for Java provides "object - relationship" persistent mechanism and query service. Hibernate persistent object is based on the ordinary Java objects, and Java collection, record information in the database into objects. Hibernate provides a sql-like object-oriented query language. Relative to the SQL language, it is more adapted to the object-oriented development mode, can say HQL is a kind of used to query the object of natural language.

Using Hibernate for persistence layer needs to be done to the two aspects. First of all, according to the relational database table to generate the corresponding persistent objects. Then in the Hibernate configuration file will be generated the persistent object mapping to relational database. Relational database, for example, order

sale\_order\_info table corresponding to the persistent object for OrderInfo. Java and its mapping file for OrderInfo. HBM. XML. The mapping file is given below code, as follows:

```
< class name = "JXC. SaleSys. Vo. OrderInfo" table = "sale_order_info"
```

```
Dynamic - insert = "true" dynamic - update = "true" >
```

```
<id name = "pono" type = "Java. Lang. String" >
```

```
< the column name = "pono length = " 10 "/ >"
```

```
The < generator class = "assigned" / > // primary key custom
```

```
< ID >
```

```
"Many - to - one name =" chmProduct"
```

```
.....
```

```
< / class >
```

Class labels in the Hibernate mapping file to use dynamic - insert, dynamic - update properties, can be optimized to generate SQL statements, improve the efficiency of SQL execution, finally can improve system performance.

## 2.The implementation of business logic layer

To an interface, not an implementation "is to use the Spring framework development programming principle, so the development time need to define an interface for the business logic class, such as order business logic interface file OrderInfoService. Java.

Secondly, business logic implementation order interface class OrderInfoService OrderInfoServiceImpl implementation class, the implementation class called OrderInfoDao, in order to use the spring framework of dependency injection to generate instances, need OrderInfoDao properties.

Third create a data access object DAO.

The data access object is used to communicate and data persistence layer, used for direct access to database for operation. In order to comply with the spring framework ideas of programming to an interface, also need to define the database operation method in OrderInfoDao interface. However, the whole system many modules have to add, delete, update the same persistence operation etc., and the logic code is very similar. So, in order to reduce duplication of code, and put these basic operations in the public interface and the implementation of the interface, through the Java generics, the normal operation of each function, and do not affect each other.

OrderInfoDaoImpl provides OrderInfoDao interface implementation based on Hibernate. In this class implements the OrderInfoDao interface method, and inherited GenericDaoHibernate class, while GenericDaoHibernate inherited HibernateDaoSupport GenericDao is realized. Is the role of the class of general database operation, extracted into a public class for the call, the advantage is to increase degree of code reuse.

All of the data access object DAO simply call the getHibernateTemplate this method; can finish almost all database operations.

Finally, Spring's transaction configuration, Spring's transaction configuration in the applicationContext. Set in the XML file, many objects through the Bean property Setter injection. The applicationContext. XML file contains as a transaction manager, object factory, contains the business logic of the service object and data access object the object reference, below is the applicationContext. Part injection in XML code:

```
The < bean id = "orderInfoService"
```

```
Class = "JXC. SaleSys. Service. Impl. OrderInfoServiceImpl" >
```

```
The < property name = "orderInfoDao" >
```

```
<ref bean = "orderInfoDao" / >
```

```
< / Property >
```

```
.....
```

```
OrderInfoDao < bean id = "" class = " JXC. SaleSys. Dao. Impl. OrderInfoDaoImpl ">
```

```
SessionFactory < property name = "" >
```

```
< ref bean = "sessionFactory" / >
```

```
< / property >
```

```
< / bean >
```

### 3.The realization of the presentation layer

In the presentation layer, all are not to be direct access to the JSP page access, but access to the Struts Action, by the Action again to return to a JSP.

Configuration error interface in the system, improve the system for the user friendliness. Configuration to prevent duplicate submissions, less system exception error. Part of the configuration code as shown below:

```
< action name = "addOrderInfo" class = "orderInfoAction method =" add ">"
< interceptor - ref name = "token" />
< interceptor - ref name = "defaultStack" />
< result name = "invalid token" > Sale_order_addInfo. JSP < / result >
< exception - the mapping result = "myException exception" = "Java. Lang. Exception" />
< result name = "myException" > Sale_order_addInfo. JSP < / result >
< result name = "success" > Sale_order_addInfo. JSP < / result >
< result name = "input" > Sale_order_addInfo. JSP < / result >
< / action >
```

### CONCLUSION

This paper USES JavaEE lightweight framework Struts, spring and Hibernate, combination of drugs into the sales management system for development. In the process of development, the lightweight framework can effectively solve the problem of coupling between levels, improve the development efficiency. Invoicing system has been put into use, the system runs stably, and save the human cost, effectively improve the efficiency of drug sales business management.

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