

# Supply, Sales and Inventory Management System Based Java and SQL Server

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**Abstract:** The development of the inventory management system mainly includes the establishment and maintenance of the database and the development of the Java. The purpose is to facilitate the store operators to input and modify the data of incoming and outgoing merchandise, customers and suppliers, easy and fast incoming and outgoing merchandise data search, complete incoming and outgoing merchandise receipt and payment fund management, and flexible incoming and outgoing merchandise inventory statistics. This paper presents the detailed design of this management system, with particular emphasis on the database part of the design, including requirement analysis, conceptual structure design, logical structure design, physical structure design, etc., and detailed testing of the system's functions.

**Keywords:** Supply; Sales and Inventory Management System; Java; SQL Server

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## 1. Requirement analysis

The Store Supply, Sales and Inventory Management System are widely used in various stores, facilitating all three categories of people - customers, employees and administrators at the same time. In the early days, stores' supply, sales and inventory information was mainly recorded and managed manually, which was not only not easy to record but also not easy to keep. With the increasing popularity of computers and the continuous development of software systems coupled with the urgent need for information system development, the Store Supply, Sales and Inventory Management System came into being. This system makes a detailed analysis of the needs of customers, employees and administrators.

### 1.1 Requirement analysis of customers

Customers can view all the products available in the store and place their orders. You can also view the order information of the customer who has placed an order. If you are not satisfied with the product, you can request a return and return the item you have purchased.<sup>[1]</sup>

### 1.2 Requirement analysis of staff

The employee's permissions are limited to queries and there is no permission to add, delete or change. Therefore, the employee's requirements are to view the inventory of the warehouse, view all order information, and view orders that are still outstanding.

### 1.3 Requirement analysis of administrator

The administrator's requirements include six main parts: Entry management, order processing, product information management, staff information management, customer information management, and supplier information management.

(1) Entry management: inventory inquiry, Entry, Entry order inquiry, display all Entry orders, returns.

(2) Order processing: inventory inquiry, view all orders, view unfinished orders, view return orders, confirm completed orders, confirm customer returns.

(3) Product information management: query all product information, query individual product information, add product information, delete product information, modify product information.

(4) Staff information management: query all staff information, query single staff information, add staff information, delete staff information, modify staff information.

(5) Customer information management: query all customer information, query single customer information, add customer information, delete customer information, modify customer information.

(6) Supplier information management: query all supplier information, query single supplier information, add supplier information, delete supplier information, modify supplier information.<sup>[2]</sup>

## 2. Conceptual structure design

Based on the requirement analysis, and the functionality that the system should have, design the entities, attributes, and relationships between entities for this database.

## 3. Logical structure design

The Relation Schema is as follows:

Staff (StaffID, StaffName, StaffContact, StaffPassword, StaffPosition, IstheAdmin)

Customer (CustomerID, CustomerName, CustomerContact, CustomerPassword, CustomerAddress)

Order (OrderID, OrderDate, Quantity, Total, OrderStatus, CustomerID, ProductID)

Foreign key: CustomerID, ProductID

Product (ProductID, ProductName, ProductEfficacy, ProductPrice, ValidityPeriod, ProductType, SupplierID)

Foreign key: SupplierNumber

Warehouse (ProductID, ProductNumber)

Foreign key: ProductID

Entry (EntryID, EntryNumber, EntryDate, ProductID)

Foreign key: ProductID

Supplier (SupplierID, SupplierName, SupplierContact, SupplierAddress)<sup>[3]</sup>

## 4. Physical structure design

(1) Staff table

Mainly used to store staff information.

Table 1 Table of Staff

Field Name	Data Type	Length	Is Empty	Primary Key
StaffID	varchar	8	not empty	primary key
StaffName	varchar	30	not empty	
StaffContact	varchar	30	not empty	
StaffPassword	varchar	30	not empty	
StaffPosition	varchar	30	not empty	
IstheAdmin	varchar	1	not empty	

Note: Whether the administrator takes the value of 1 or 0, where 1 represents the administrator, 0 represents the general staff, the default value is 0. The staff number takes the number beginning with 201, 202, etc. 2.<sup>[4]</sup>

(2) Customer table

Mainly used to store customer information.

Table 2 Table of Customer

Field Name	Data Type	Length	Is Empty	Primary Key
CustomerID	varchar	8	not empty	primary key
CustomerName	varchar	30	not empty	
CustomerContact	varchar	30	not empty	
CustomerPassword	varchar	30	not empty	
CustomerAddress	varchar	90	not empty	

Note: The customer number is taken as 101, 102 and other numbers starting with 1.

(3) Order table

Mainly used to store order information.

Table 3 Table of Order

Field Name	Data Type	Length	Is Empty	Primary Key
OrderID	varchar	8	not empty	primary key
OrderDate	date		not empty	
ProductID	varchar	8	not empty	
Quantity	int		not empty	
Total	float		not empty	
OrderStatus	varchar	1	not empty	
CustomerID	varchar	8	not empty	

Foreign key: CustomerID, ProductID

Note: The order status takes the values 0, 1, 2, 3. where 0 represents an incomplete order, 1 represents a completed order, 2 represents a returned order, 3 represents a returned completed order, the default value is 0. The order number takes the number starting with 301, 302, etc. The number starts with 3.

(4) Product table

Mainly used to store product information.

Foreign key: SupplierID

Note: The item number is taken as 401, 402 and other numbers starting with 4.

(5) Warehouse table

Mainly used to keep the number of items.

Foreign key: ProductID

Note: The number of products is 0 by default, and the product number is taken as 401, 402 and other numbers starting

with 4.

(6) Entry table

Mainly used to store incoming information.

Foreign key:ProductID

Note: The incoming order number is taken as 501, 502 and other numbers starting with 5.

(7) Supplier table

Mainly used to store supplier information.

Note: The vendor number is taken as 601, 602, etc. starting with the number 6.

## 5. System advantages and disadvantages

### 5.1 Advantages

(1) The system has three identities: customer, employee, and administrator. It broadens the people who can use the system and makes the system more widely available.

(2) Simple and easy to understand page operation, good interactivity.

(3) The use of techniques such as views and triggers simplifies programming and improves the maintainability of code.

### 5.2 Disadvantages

(1) The functions considered in the system are not yet comprehensive, and more functions could be added.

(2) The system can also add some new technologies to improve system security, such as data backup.

## 6. Concluding remarks

This system is based on JAVA and SQL Server development of supply,sales and inventory management system, the system provides the administrator, staff and customers with the corresponding functions they need, through the SQL Server database for data manipulation and storage, but also greatly facilitates the administrator, staff for the management of the supermarket, but also to facilitate better customer purchases and other operations, friendly interface easy to use, greatly improve the efficiency of supply,sales and inventory management.<sup>[5]</sup>

**Profile:** Kong Qinghao (2002.11 --), male, Han nationality,from heze, Shandong province, bachelor degree, research direction: machine learning.

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