Software Requirement Specification

– Warehouse Management System

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1. Abstract

In today's fast-paced business environment, efficient warehouse management is crucial for optimizing operations and attaining organizational success. The Warehouse Management System (WMS) is designed to meet these challenges by providing a centralized platform for effective inventory management, streamlined workflows, and enhanced communication. This web-based application offers a comprehensive suite of features including inventory tracking, order management, and real-time reporting. Users can easily find a place to store their stocks, manage inventory levels, view stock statuses, and ensure accurate inventory data. With its user-friendly interface and robust functionality, the WMS promotes seamless collaboration among warehouse teams, leading to improved efficiency and customer satisfaction.

2. Objective and Scope

The objective and the scope of the project is to build a Warehouse Management System that is capable of receiving orders and inventory management.

The scope of the product includes the following basic features:

- The product enables suppliers to place orders for storing and maintaining their stock status in a warehouse.
- Admin can efficiently manage stock, supplier information, and transaction management, along with reporting for incoming and outgoing stock, aiming to streamline warehouse operations effectively.
- Allows to add stock details such as unique stock id, brand name, supplier name, quantity, and date.
- Maintains Supplier information such as supplier name, address, contact details, and product catalogs.
- Enable to monitor the incoming and outgoing stock in the warehouse through in & out transaction.
- It includes a feature that generates reports for both incoming and outgoing stock.
- The project end users are suppliers seeking storage solutions for their stock and warehouses equipped to receive orders.
- Suppliers place requests to store their stock, maintain stock details in the warehouse, and monitor stock levels.
- The admin accepts suppliers' orders and maintains their information, including supplier name, address, contact details, and product catalogs. They are responsible for adding, updating, and deleting stock details, which include unique stock IDs, brand names, supplier

names, quantities, and order receiving dates.

3. Functional Requirements

3.1 User Login

Provide a user-friendly registration form where individuals can sign up for the WMS webpage by entering essential information such as their full name, email address, and desired username. Specify password requirements such as minimum length, inclusion of special characters, and complexity to enhance security and protect user accounts from unauthorized access.

Each and every end user should be authenticated with a Username and Password to login into the system. Validations for Username and Password.

3.2 Order Placement

Suppliers seeking storage solutions can place an order request to the warehouse admin along with their details including name, address, contact details, stock type and stock quantity.

3.3 Add/Edit/Delete Supplier

The warehouse admin reviews and accepts convincing requests, gathering supplier details like name, address, and contact information for maintenance in the system.

3.4 Add/Edit/Delete Stock

Add Stock:

Stocks are added into the database through the Add Stocks page by admin and supplier. The stock information consists of unique stock id, brand name, supplier name, stock quantity and date on which it is received.

Edit Stock:

Stocks which are added through the Add Stocks page are saved into the database, which can be edited, updated, or deleted.

3.5 View In & Out Transaction

Incoming stock

Admin adds the receiving stock details in the incoming stock admin page. The stock information consists of a unique stock id, supplier name, stock quantity and the date on which the stock is received.

Outgoing stock

The outgoing stock details will be controlled by the admin. The stock information consists of unique stock id, supplier retrieved the stock, stock quantity and the date on which the stock is delivered.

3.6 View Stock

The stock details in the warehouse can be monitored by the admin and supplier. It provides each stock detail and its status separately that are stored in the database. So, it is convenient to know each stock status.

3.7 Generate Report

This system has reporting capabilities. It shows the report of total incoming stock and outgoing stock.

4. Non-Functional Requirements

The system is designed with stringent security measures to ensure that only authorized users can access it using a unique username and password combination. This enhances security and protects sensitive information. Additionally, the system is optimized for performance, allowing for easy tracking of records and seamless updating processes. Its user-friendly interface makes it highly interactive, providing a smooth and efficient user experience. Moreover, the system prioritizes maintainability by having backups available for the database, ensuring data integrity and reliability in case of any unforeseen issues or system failures.

5. Design

5.1 High Level Design

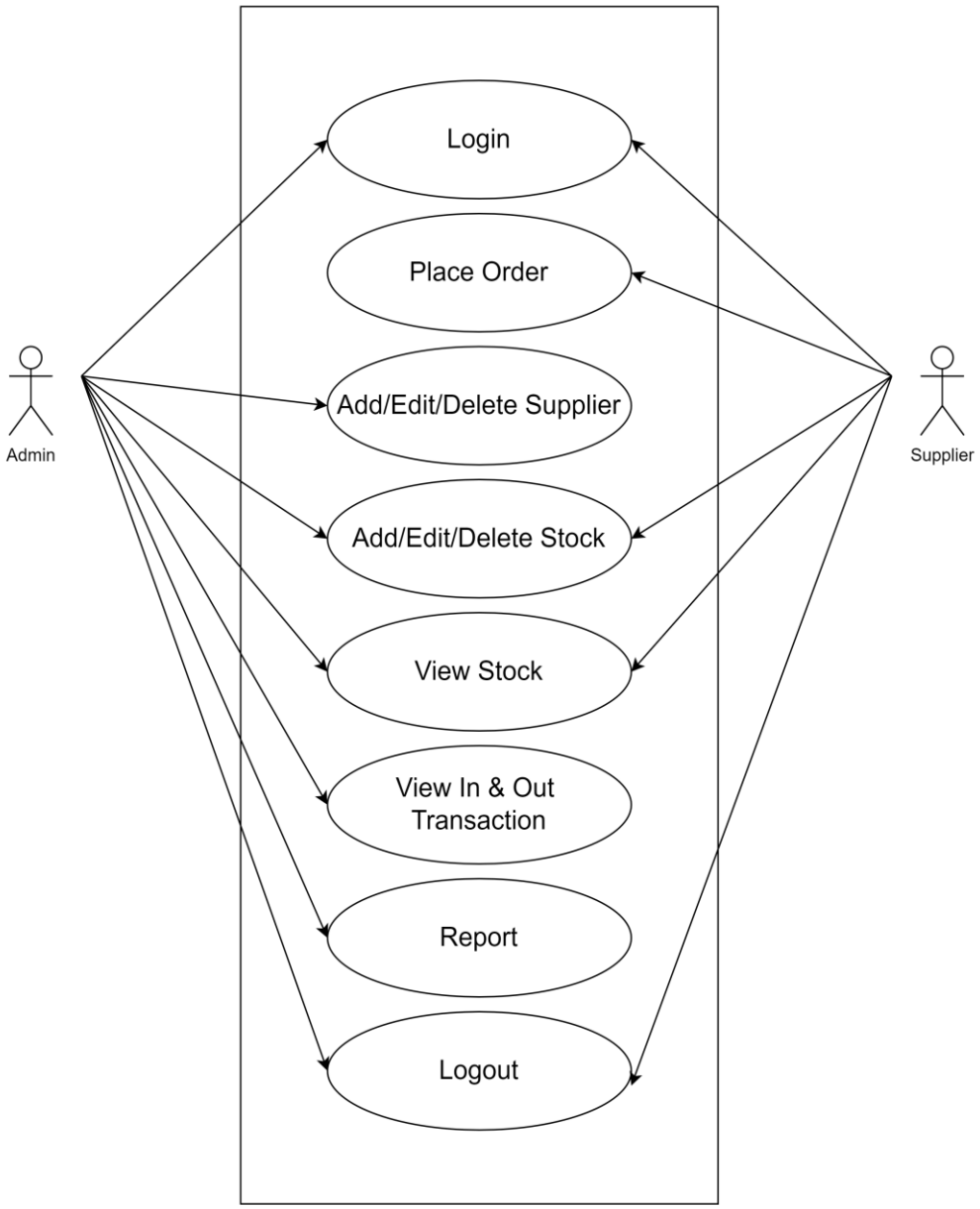
The higher-level design of the Warehouse Management System (WMS) is structured on a client-server architecture, leveraging modern web technologies for the front-end and a scalable backend server. The frontend is built using frameworks like HTML, CSS, and JavaScript providing a dynamic user interface for intuitive interaction. On the backend, a robust technology stack such as Node.js is employed to create RESTful APIs for seamless communication with the frontend. Data is stored in a relational database management system (RDBMS) like PostgreSQL or MySQL, featuring a well-defined schema with tables for inventory, orders, suppliers, and transactions. User authentication is ensured using industry-standard mechanisms for effective permission management. Modules for inventory management, order processing, transaction controls, and reporting are integrated, utilizing algorithms for efficient inventory tracking and order fulfillment. Scalability, performance optimization, and security measures such as encryption and regular audits are implemented to maintain a robust and reliable WMS architecture.

5.2 Low Level Design

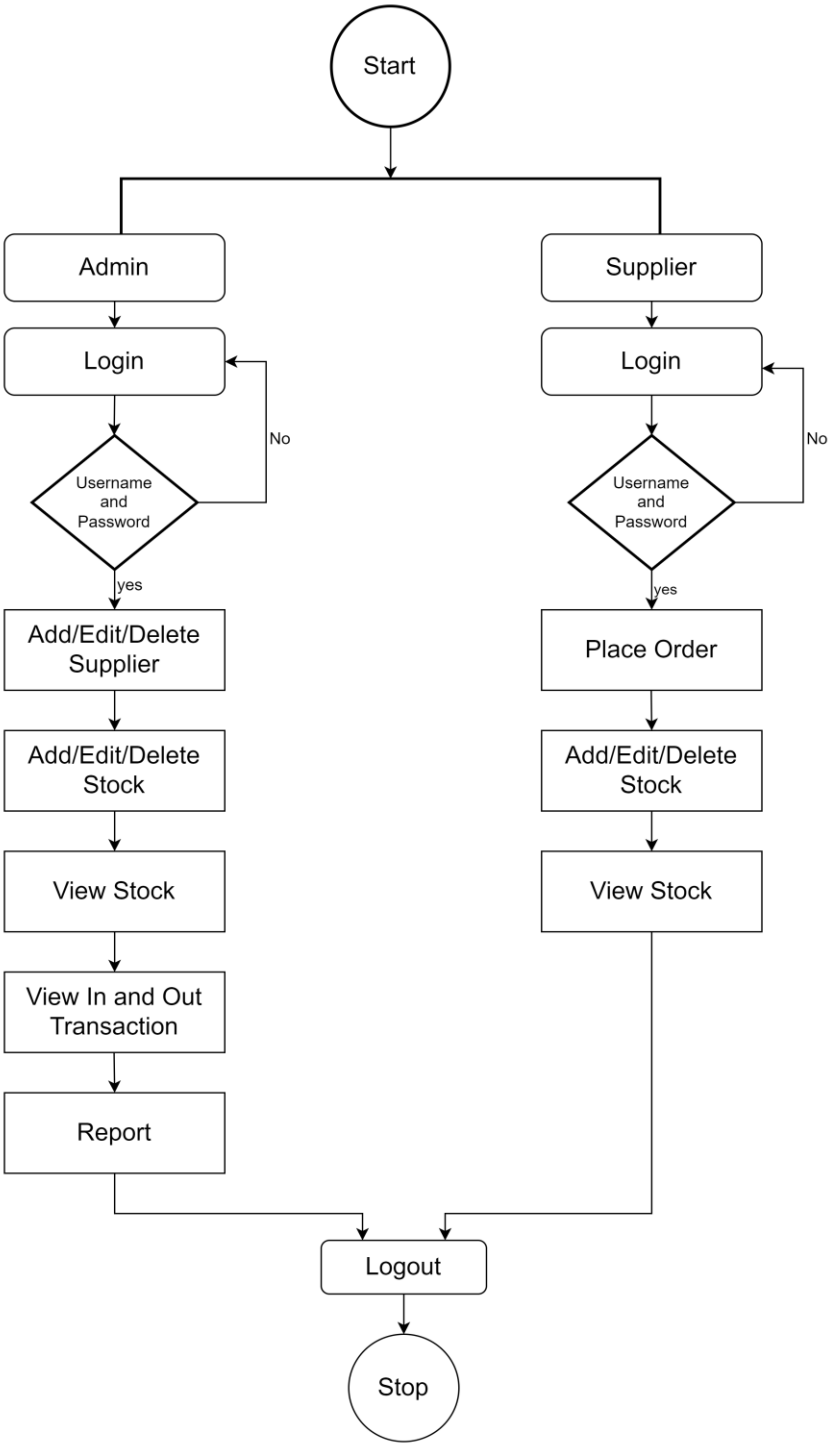
The low-level design of a Warehouse Management System (WMS) comprises several key components meticulously planned for optimal functionality. Firstly, the database design includes tables like Suppliers, Orders, and Stock, with defined relationships and indexes for efficient data retrieval. Backend architecture follows a modular structure with modules such as Order Placement, Inventory Management, and Transaction Management, interconnected via middleware for seamless data processing and communication. Authentication methods like sessions or tokens are implemented alongside role-based access control (RBAC) for user permissions. Inventory management functionalities include Adding, editing, updating, or deleting stock and tracking stock levels. Order Placement handles order processing and status tracking. Reporting and analytics provide real-time insights through dashboards, reports, and data visualization tools. Security measures encompass data encryption, backup procedures, and input validation.

6. UML Diagrams

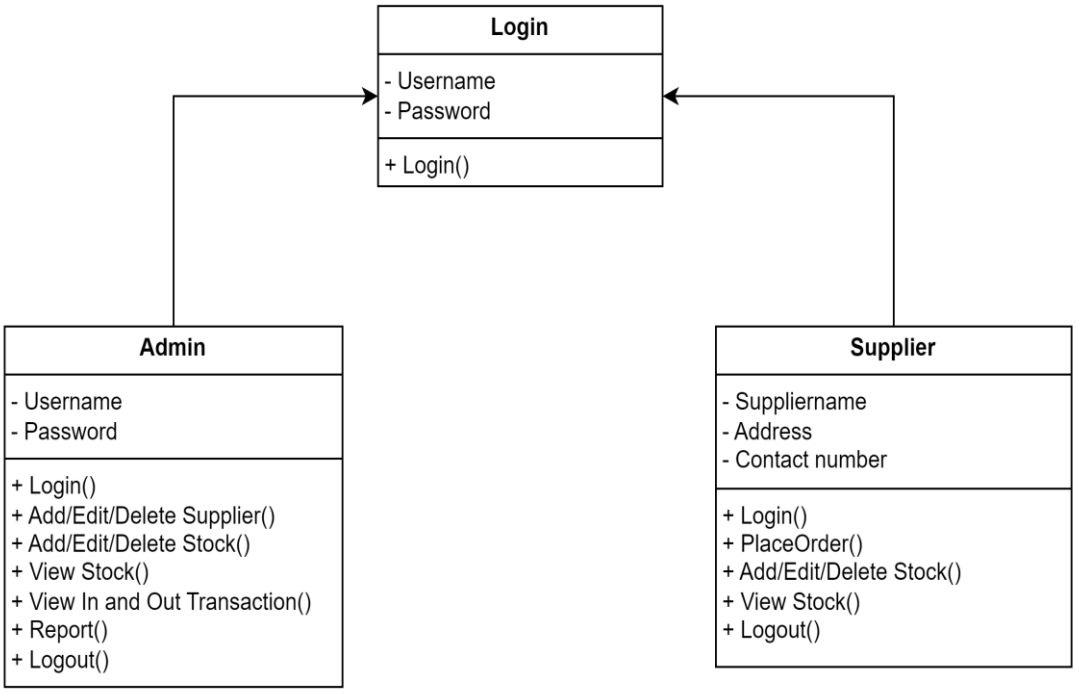
6.1 Use Case Diagram



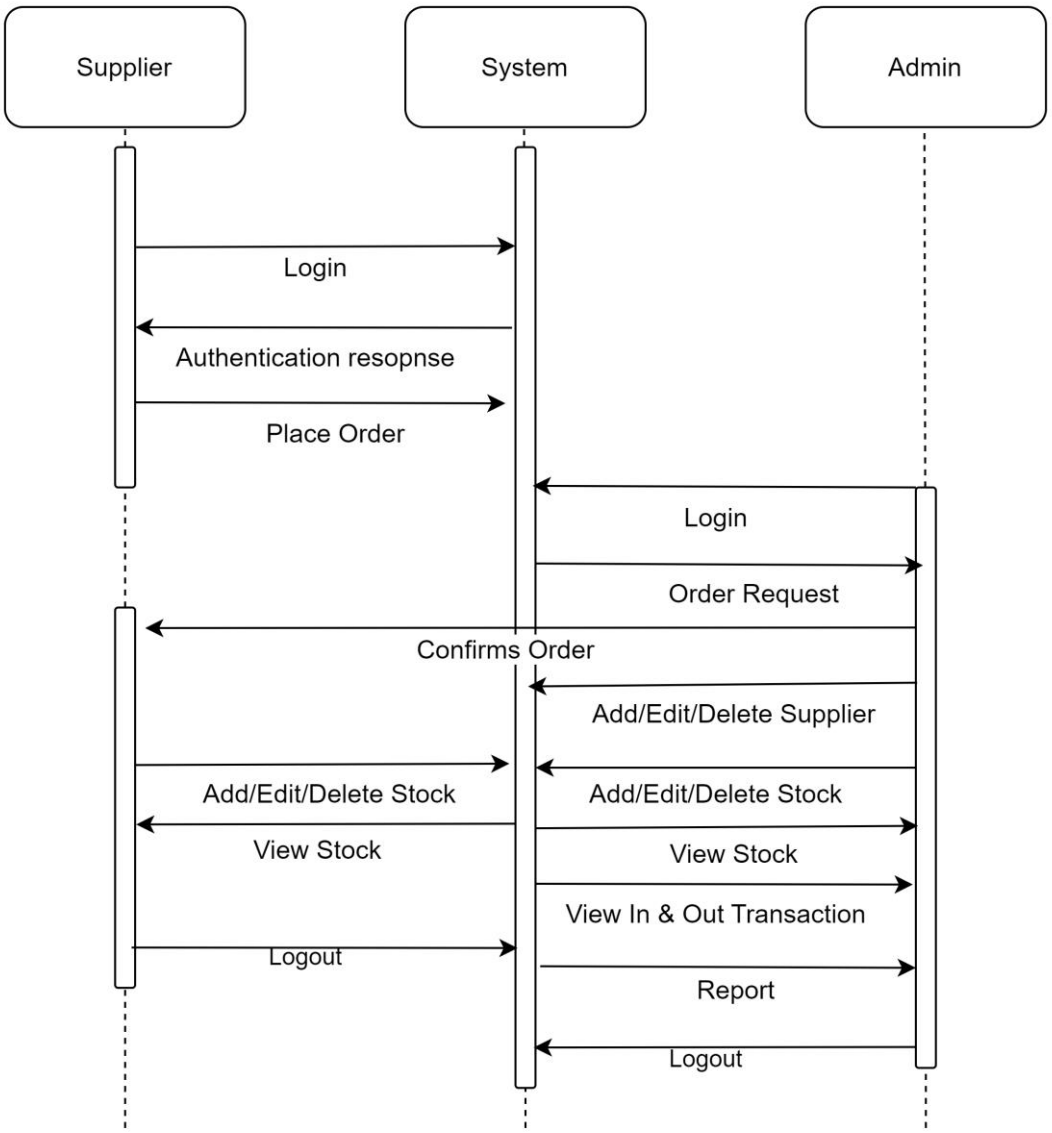
6.2 Flow Chart



6.3 Class Diagram



6.4 Sequence Diagram



7. Test Cases

The Functional Specifications, Detailed Design Specification, and Requirements together drive the test plan.

Test Case	Test Purpose	Test Condition	Expected Outcome
User Registration	To verify that a user can successfully register in the system.	User provides valid registration details (username, email, password).	User account is created successfully, and the user is redirected to the login page with a success message.
User Login	To verify that a registered user can log in to the system.	User provides valid login credentials (username/email and password).	User is authenticated and redirected to the main dashboard.
Place Order	To allow Supplier to place their order successfully.	Allow Suppliers to place their order along with the order details. It should notify to the admin	Users can be able to place their order and it is submitted to the admin for acceptance.
Manage Supplier Information	To allow suppliers to submit their details.	Allow supplier to share their details if the order is confirmed from admin.	The supplier information is shared successfully.
Manage Stock Details	To add, edit, update, or delete stocks details successfully.	Admin and supplier able to manage the stock details	Admin can successfully add, edit, update, or delete the stock details.

Transaction controls	To verify the incoming and outgoing stock in the warehouse.	Admin able to monitor the incoming and outgoing stock.	Admin can be able to manage the stock transactions successfully.
Report Generation	To allow admin to generate reports successfully.	Admin able to generate report on incoming and outgoing stock.	Admin can be able to generate report on stock transaction successfully.

8. Conclusion

The Warehouse Management System (WMS) is crucial for efficient business operations. It helps manage inventory, orders, and reports in one place, making work easier for warehouse teams. With its user-friendly design, WMS promotes teamwork and boosts productivity, leading to happier customers and better business outcomes.