

Warehouse Management System

1. User Authentication:

- Secure login system for Admin and Staff roles. Role-based access control (RBAC) for managing permissions: Admin can manage inventory and staff, while Staff can update stock levels and fulfill orders.
- Use a Users table with fields: UserId, Username, PasswordHash, Role, Email, and IsActive.

2. Inventory Tracking:

- Admin can add new items to the inventory, update stock levels, and remove discontinued or damaged items.
- Track item details such as SKU, name, category, description, and stock quantity.
- Use an Inventory table with fields: ItemId, SKU, Name, Category, Description, Quantity, Price, and Location.

3. Order Fulfillment:

- Staff can view incoming orders and pick the items for packing.
- Track the status of orders (Pending, In Progress, Shipped, Delivered).
- Admin can assign packing tasks to staff and monitor order progress.
- Use an Orders table with fields: OrderId, CustomerId, ItemId, Quantity, Status, ShippingAddress, and OrderDate.

4. Stock Alerts:

- Admin receives automatic notifications for low stock items, based on predefined thresholds. Alerts can be sent via email or SMS to notify the admin to reorder or restock.
- Use a StockAlerts table with fields: AlertId, ItemId, Threshold, AlertDate, and Status.

5. Audit Logs:

- Track and store all updates made to inventory, orders, and staff actions for transparency and security.
- Admin can view audit logs for item additions, deletions, and updates to track stock movements and identify discrepancies.
- Use an AuditLogs table with fields: LogId, ActionType, ItemId, UserId, ActionDate, and Description.

6. Order Processing:

- Customers can place orders for items, which will be tracked by staff through the warehouse system.
- Order status is updated in real-time to ensure smooth processing from receipt to shipment.
- Admin and Staff can view a detailed order history, including any order modifications or cancellations.
- Use an OrderProcessing table with fields: ProcessId, OrderId, Status, StartDate, CompletionDate, and StaffId.

7. Warehouse Staff Management:

- Admin can manage staff accounts, assign tasks, and set permissions based on job roles (e.g., warehouse operator, packer).
- Staff can update their task status and track performance.
- Admin can assign shifts and manage schedules for warehouse staff.
- Use a Staff table with fields: StaffId, Name, Role, Email, Shift, and Status.

8. Barcode Scanning Integration:

- Use barcode scanners to update inventory in real-time as items are moved, packed, or shipped.
- Barcode scanning speeds up stock updates and reduces manual errors.
- Track item movements by scanning the barcode, ensuring that the correct quantities are updated.

- Use a BarcodeLogs table with fields: BarcodeId, ItemId, ScanDate, StaffId, and ActionType.

9. Shipping Integration:

- Automatically generate shipping labels based on order details.
- Admin can configure shipping methods (standard, express) and integrate with third-party courier services. Track shipment progress, including delivery status.
- Use a ShippingInfo table with fields: ShippingId, OrderId, Courier, TrackingNumber, ShippingDate, and EstimatedDelivery.

10. Inventory Valuation:

- Calculate the total value of inventory based on stock levels and unit prices.
- Admin can view detailed reports on the cost of goods sold (COGS) and inventory value at any time.
- Use a Valuation table with fields: ValuationId, ItemId, Quantity, UnitPrice, TotalValue, and Date.

11. Stock Movement History:

- Track the movement of inventory items from one warehouse location to another (if applicable). View the complete history of stock movements for auditing and reporting purposes.
- Use a StockMovement table with fields: MovementId, ItemId, FromLocation, ToLocation, Quantity, MovementDate, and Reason.

12. Reporting and Analytics:

- Generate reports on warehouse performance, including order fulfillment time, stock levels, and inventory turnover.
- Admin can view dashboards with visual insights into order statuses, stock health, and staff efficiency.
- Use a Reports table with fields: ReportId, Type, GeneratedDate, Data, and CreatedBy.

Tech Stack

Layer	Technology
BackEnd	Node.js: Version 18.x (LTS) or 20.x (Latest) Express.js: Version 4.x
FrontEnd	Angular.js 17 or Later
Database	SQL Server 2022 or MongoDB 6.0
Authentication	JWT or OAuth 2.0

Evaluation Criteria

Criteria	Weightage	Description
Presentation	10 Marks	Clarity, structure, and quality of the presentation, including how well the project is explained.
Code Walkthrough	5 Marks	Clarity of code explanation, organization, and adherence to coding standards.
API Endpoints	25 Marks	Correctness, completeness, and functionality of REST API endpoints with proper HTTP methods.
Frontend	25 Marks	Quality, responsiveness, user experience (UX), and integration with backend APIs.
Models and DB Schema	25 Marks	Accuracy of database schema design, model relationships, and ORM usage.
Innovation	5 Marks	Creative or unique features added beyond the basic requirements.

All the best!!