Title: Database Warehouse Management System

Problem Description and Domain:
The modern warehouse faces significant challenges in managing diverse operations such as inventory tracking, order processing, and logistics coordination. Inefficiencies in these areas can lead to increased operational costs, delayed shipments, and unsatisfied customers. The domain of this project is a warehouse management system that interfaces with various stakeholders like suppliers, operators, end-users, partners, and carriers.

Solution:

The solution developed is an Integrated Warehouse Management System (IWMS) that provides a unified platform to manage all aspects of warehouse operations from inventory replenishment to shipping orders. The system uses a relational database to maintain and track detailed information about products, orders, and stakeholders involved in the supply chain.

User Interfaces:

- Login Interface: Allows warehouse staff to Login using username and password, leading to the dashboard
- Dashboard for Operators: Allows warehouse staff to view and update inventory levels, process replenishment orders, and manage shipping orders.
- Supplier Interface: Enables suppliers to view order statuses, manage shipment details, and communicate with warehouse managers.
- Management Interface: Provides warehouse managers with tools to oversee operations, generate reports, and analyze trends.
- Partner and End-User Portal: Allows business partners and end-users to track their orders, manage shipping details, and review their transaction histories.

Preliminary ER

1. Supplier
    - Attributes: Vendorid, FirstName, LastName, Email, Phone, StreetAddress1, StreetAdress2, City, State, Country, Zip_PostalCode, Company
2. ReplenishmentOrder
    - Attributes: ASNorderid, CreatedByid, ASNItemid, Quantity, ETADate, CarrierName, AirWayBillNumber, Status, ReceivedByid, ReceiptDate, PutAwayAisle, PutAwayBin
3. Operator
    - Attributes: Employeeid, FirstName, LastName, Wages, Type, Email, Phone, StreetAddress1, StreetAddress2, City, State, Country, Zip_PostalCode

4. Stock
    - Attributes: Itemid, PartNumber, PartDescription, Active, ItemCost, ItemCurrencyCode, Length, Width, Height, DimensionUOM, Weight, WeightUOM, Quantity
5. EndUser
    - Attributes: Userid, FirstName, LastName, Email, Phone, StreetAddress1, StreetAddress2, City, State, Country, Zip_PostalCode
6. Partner
    - Attributes: Partnerid, Partnername, Email, Phone, StreetAddress1, StreetAddress2, City, State, Country, Zip_PostalCode
7. Carrier
    - Attributes: Carrierid, Name, SLA, FirstName, LastName, Email, Phone, StreetAddress1, StreetAddress2, City, State, Country, Zip_PostalCode
8. ShippingOrder
    - Attributes: ShippingOrderid, SLA, Status, ShipToUserid, ShippingItemid, Quantity, ETADate, CreatedByid, FulfilledBy, FulfilledDate, Packing, PackageLength, PackageWidth, PackageHeight, PackageDimensionUOM, PackageWeight, PackageWeightUOM, Carrierid, CarrierSLA, AWB, RAWB

Relationships:

- ReplenishmentOrder to Supplier: Many replenishment orders can be created by a single supplier (one-to-many).
- ReplenishmentOrder to Stock: Each replenishment order is associated with a particular stock item (many-to-one).
- ReplenishmentOrder to Operator: Operators can receive many replenishment orders (one-to-many).
- ShippingOrder to EndUser: Each shipping order is associated with an end user (many-to-one).
- ShippingOrder to Partner: Each shipping order is created by a partner (many-to-one).
- ShippingOrder to Carrier: Each shipping order is associated with a carrier (many-to-one).
- ShippingOrder to Stock: Each shipping order is associated with stock items (many-to-one).
- ShippingOrder to Operator: Operators can fulfill many shipping orders (one-to-many).

Technology Used:

- Backend: The system will be developed using Java and MySQL for relational data management due to its robustness and support for complex queries
- Frontend: The User interfaces will be developed using JavaScript & HTML to provide a responsive and interactive experience

- Other Tools: Spring Boot/Maven is utilized for its robust backend services and ease of integration with other technologies.