Business Rules for DataPioneers Inventory Management System

This document outlines the core business rules, and validation constraints implemented in the DataPioneers Inventory Management System. These rules ensure data integrity, proper functioning of the order management system, and alignment with real-world inventory practices.

1. Customer Data Validation

- **First Name, Last Name, and Email must not be blank**
  - Enforced using NOT NULL constraints.
- **Email must be unique across customers**
  - Enforced using the UNIQUE constraint.
- **Phone number must be at least 10 characters and is mandatory**
  - Enforced using NOT NULL and CHECK (LENGTH(Phone) >= 10).

2. Supplier Data Validation

- **Supplier names, contact persons, and phone numbers are mandatory**
  - Enforced using NOT NULL constraints.
- **Phone number format validation**
  - Minimum length check of 10 digits.

3. Product Rules

- **Price must be a positive number and cannot exceed Maximum Retail Price (MRP)**
  - Enforced using CHECK (Price > 0 AND Price <= 10000).
- **Stock quantity cannot be negative**
  - Enforced using CHECK (StockQuantity >= 0).
- **Category must be specified and cannot be null**

- **Timestamps (CreatedAt, UpdatedAt) are auto-managed**

4. Order Management Rules

- **Order quantity must be greater than zero**
  - Enforced using CHECK (Quantity > 0) in OrderDetails table.
- **Orders with unavailable stock are accepted as 'Backordered'**
  - Automatically marked as 'Backordered' during insertion.
- **Once stock is replenished, backorders are automatically fulfilled**
  - Implemented via a stored procedure fulfill_backorders(product_id).
- **TotalAmount must be greater than 0**
  - Enforced via CHECK (TotalAmount > 0).

5. Inventory Management Rules

- **Stock is tracked per warehouse per product**
  - Managed via ProductWarehouse table.
- **Stock level must be non-negative**
  - Enforced via CHECK (StockLevel >= 0).
- **SupplierID must be valid and consistent**
  - Enforced via foreign key constraints.

6. Discount and Tax Rules (Extension-ready)

While discounts and taxes are not yet implemented, the schema is designed to accommodate these in future phases.

- **Discount should be applied before tax in total calculation** *(To be enforced in future logic)*
- **Products in category 'Perishable' are not eligible for discounts** *(Business rule for future implementation)*

7. Auto Reorder Rule (To Be Extended)

- **When product stock drops below a defined threshold**, auto reordering logic can be implemented using triggers or cron-based scripts in the future. This is hinted through the ThresholdQuantity attribute (not yet implemented in schema).

8. Views-Based Reporting Rules

- **Views summarize product inventory, price changes, and regional/weekly sales**
  - Views include:
    - Current_Inventory_Status
    - Product_Wise_Price_Changes
    - Total_Sales_Region_Wise
    - Week_Wise_Sales

These business rules collectively ensure that the system is robust, scalable, and suitable for real-world inventory and order management operations.