**Case Study: Manufacturing Supply Chain Management System**

**Problem Statement:**

Design and implement a Manufacturing Supply Chain Management System using Oracle SQL and PL/SQL. The system will be used to manage suppliers, raw material orders, shipments, and inventory levels. Your task is to create the necessary database schema, populate the database with sample data, and develop PL/SQL procedures to handle order placement, shipment tracking, and generating supply chain reports.

**Requirements:**

1. **Supplier Management**:
   * Implement the functionality to add, update, delete, and search for suppliers.
   * Ensure that each supplier has attributes such as SUPPLIER\_ID, NAME, CONTACT\_NAME, CONTACT\_EMAIL, CONTACT\_PHONE, and ADDRESS.
2. **Raw Material Order Management**:
   * Implement the functionality to place, update, delete, and track raw material orders.
   * Ensure that each order has attributes such as ORDER\_ID, SUPPLIER\_ID, ORDER\_DATE, EXPECTED\_DELIVERY\_DATE, and STATUS.
3. **Shipment Management**:
   * Implement the functionality to manage and track shipments.
   * Ensure that each shipment has attributes such as SHIPMENT\_ID, ORDER\_ID, SHIPMENT\_DATE, DELIVERY\_DATE, and STATUS.
4. **Inventory Management**:
   * Implement the functionality to track inventory levels of raw materials.
   * Ensure that each inventory record has attributes such as INVENTORY\_ID, MATERIAL\_ID, QUANTITY, and LAST\_UPDATED.

**Tasks:**

1. **Design the Database Schema**:
   * Create the Suppliers, Orders, Shipments, and Inventory tables with the appropriate fields and constraints.
   * Define primary keys and foreign keys to maintain data integrity.
2. **Populate the Database with Sample Data**:
   * Insert sample records into the Suppliers, Orders, Shipments, and Inventory tables to facilitate testing of the system.
3. **Develop PL/SQL Procedures**:
   * Create a procedure to handle order placement. The procedure should insert a new order record and update the inventory levels.
   * Create a procedure to handle shipment tracking. The procedure should update the shipment status and the expected delivery date.
   * Create a procedure to generate supply chain reports, including details such as supplier information, order status, and inventory levels.

**Expected Outcomes:**

1. **Suppliers Table**:
   * Contains all information about the suppliers involved in the supply chain.
2. **Orders Table**:
   * Tracks the raw material orders placed with suppliers.
3. **Shipments Table**:
   * Logs the shipment details and delivery status.
4. **Inventory Table**:
   * Tracks inventory levels of raw materials.
5. **PL/SQL Procedures**:
   * Efficiently manage order placement, shipment tracking, and generating supply chain reports, maintaining accurate records in the database.

**Deliverables:**

1. SQL scripts to create the Suppliers, Orders, Shipments, and Inventory tables.
2. SQL scripts to insert sample data into the tables.
3. PL/SQL scripts for the procedures to handle order placement, shipment tracking, and generate supply chain reports.
4. Documentation explaining how to set up and use the system, including how to run the PL/SQL procedures.

**Database Schema:**

1. **Suppliers Table**:
   * **SUPPLIER\_ID**: Number, Primary Key
   * **NAME**: Varchar2(100)
   * **CONTACT\_NAME**: Varchar2(100)
   * **CONTACT\_EMAIL**: Varchar2(100)
   * **CONTACT\_PHONE**: Varchar2(20)
   * **ADDRESS**: Varchar2(255)
2. **Orders Table**:
   * **ORDER\_ID**: Number, Primary Key
   * **SUPPLIER\_ID**: Number, Foreign Key References Suppliers(SUPPLIER\_ID)
   * **ORDER\_DATE**: Date
   * **EXPECTED\_DELIVERY\_DATE**: Date
   * **STATUS**: Varchar2(50)
3. **Shipments Table**:
   * **SHIPMENT\_ID**: Number, Primary Key
   * **ORDER\_ID**: Number, Foreign Key References Orders(ORDER\_ID)
   * **SHIPMENT\_DATE**: Date
   * **DELIVERY\_DATE**: Date
   * **STATUS**: Varchar2(50)
4. **Inventory Table**:
   * **INVENTORY\_ID**: Number, Primary Key
   * **MATERIAL\_ID**: Number
   * **QUANTITY**: Number
   * **LAST\_UPDATED**: Date

**Case Study Task:**

* **Design**: Create the database schema as provided.
* **Implement**: Insert sample data into the tables.
* **Develop**: Write PL/SQL procedures for handling order placement, shipment tracking, and generating supply chain reports.
* **Test**: Test the procedures with various scenarios (e.g., placing an order, tracking a shipment, generating reports, ensuring proper updates).