**PROJECT Supply Chain Management**

**Objective** To create a database table and populate the table with database records.

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***PROJECT DESCRIPTION***

This project has you creating a database table using SQL and then populating the table with various database records.

The focus of this database application is Supply Chain management.

Follow the instructions below to complete this project.

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***Information about This Project***

This project revolves around a database scheme that concentrates on supply chain activities.

A supply chain controls the flow of material, information, money and services from raw material suppliers through factories and warehouses to the end customer.

The typical chain has this sequential structure:

**Supplier → Factory → Warehouse → Distribution → End Customer**

As an example of a supply chain, consider a customer purchasing a cold breakfast cereal. Here, the supplier could be the manufacturer of the product. The product is produced in large quantities in a factory. The factory bundles the breakfast cereals and sends them to a regional warehouse, which in turn ships the bundles to a district distribution center. The distribution center then delivers the items to retail or grocery stores to make the product available for customer purchase.

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***Steps to Complete This Project***

**STEP 1** **Create the Tables**

In your database schema, create the following tables:

**[ Database Applications: Supply Chain Management ]**

**Suppliers Table**

|  |  |  |
| --- | --- | --- |
| **Supplier\_ID** | **int** | **PK** |
| **Supplier\_Name** | **VARCHAR** |  |
| **Location\_Code** | **INT** |  |
| **Contact\_Person** | **VARCHAR** |  |
| **Other\_Details** | **VARCHAR** |  |

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**Products Table**

|  |  |  |
| --- | --- | --- |
| **Product\_ID** | **INT** | **PK** |
| **Product\_Name** | **VARCHAR** |  |
| **Product\_Description** | **VARCHAR** |  |
| **Price** | **CURRENCY** |  |
| **Supplier\_ID** | **INT** | **FK** |
| **Status** | **VARCHAR** |  |

**Customers Table**

|  |  |  |
| --- | --- | --- |
| **Customer\_ID** | **INT** | **PK** |
| **Cust\_Name** | **VARCHAR** |  |
| **Cust\_Locale** | **INT** |  |
| **Payment\_Code** | **INT** |  |
| **Cust\_Details** | **VARCHAR** |  |

**Orders Table**

|  |  |  |
| --- | --- | --- |
| **Order\_ID** | **INT** | **PK** |
| **Customer\_ID** | **INT** | **FK** |
| **Order\_Status** | **VARCHAR** |  |
| **Sales\_ID** | **INT** | **FK** |

**Invoices Table**

|  |  |  |  |
| --- | --- | --- | --- |
| **Invoice\_ID** | **Customer\_ID** | **Invoice\_Amt** | **Inv\_Date** |
| **100** | **200** |  |  |
| **110** | **203** |  |  |
| **120** | **201** |  |  |
| **130** | **204** |  |  |

**Shippers Table**

|  |  |
| --- | --- |
| **Shipper\_ID** | **Shipper\_Name** |
| **100** | **UPS** |
| **110** | **DHL** |
| **120** | **FedEx** |
| **130** | **USPS** |
| **150** | **other** |

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**Order Items**

|  |  |  |
| --- | --- | --- |
| **Order\_Items\_ID** | **INT** | **PK** |
| **Invoice\_ID** | **INT** | **FK** |
| **Product\_ID** | **INT** | **FK** |
| **Quantity** | **INT** |  |

**Sales Table**

|  |  |  |
| --- | --- | --- |
| **Sales\_ID** | **INT** | **PK** |
| **Salesperson** | **INT** |  |
| **Order\_Status** | **VARCHAR** |  |
| **Customer\_ID** | **INT** | **FK** |

**STEP 2** **Populate the Tables**

Populate your database tables with at least two records each in order to get an idea of the actions that will exist between the tables.

**STEP 3** **Cycle Through the Supply Chain Process**

With your database application now containing tables and records, insert additional records in your application according to these supply chain activities.

**Use your own name instead of Customer X , when it is referenced below.**

**Note: you may have to adjust the existing table fields or supplement your schema with additional tables in order to completely track a customer’s purchase from the supplier to the distributor.**

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• **[ Action 1 / Operation 1 ]**

Customer X orders two office supply items from an online Web site.

• **[ Action 2 / Operation 2 ]**

An invoice was generated, issued with today’s date, and payment was received from the customer ( an invoice details document was updated - to have the customer’s purchase added into today's detailed batch activities )

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• The products that were ordered are verified that they exist in the supplier’s inventory.

• The Warehouse is alerted to the customer’s order.

• The customer’s product order is given to the shipping department.

• The Quantity on Hand ( QOH ) is reduced by the number of items

That were purchased by the customer.

• The Supplier is notified that the ordered items were removed from the seller’s inventory.

• The customer is alerted that the products have been shipped.

• The Customer Service Department has been alerted that the customer’s order has been processed and will contact the customer when the order has been delivered.

Show your current schema in action by taking screenshots of each of the above events / transactions.

**[ Action 3 / Review Your Schema ]**

Now make the following changes in the schema.

**(1)** Remove order\_status from the sales table. In this manner, sales will just focus on sale\_sid and sales\_person and not on the order, which will keep the table normalized.

**(2)** Add shipping\_Id to orders, which already has an order\_status.

order\_status takes a value "Ready" or "SHIPPED or DELIVERED".

Ready means it is being readied for shipping, SHIPPED means in transit and DELIVERED means it was handed over to the customer.

**(3)** Add quantity to the products table so that we know how much quantity the supplier has currently.

**(4)** Added a new table Warehouse\_Quantity to track the quantity available for each product at the warehouse. When Items are shipped, this table will show the reduction in the amount and new items from supplier will be added here. This tracks Quantity on Hand ( QOH ) .

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**(5)** Add a new table called Invoice\_Detail which tracks invoice\_id, product\_id, quantity per product and amount per product. More information can be added here including tax, discounts, etc.

**STEP 4** **Perform the Analytics**

Next perform each of these analytical functions on your updated schema.

• Shipment status / lag time ( analytics ) / lead times ( analytics )

Note: more information on lag and lead times is available here

<https://www.oracletutorial.com/oracle-analytic-functions/oracle-lag/>

**STEP 5** **Submit Your Completed Application**

Submit your database application as well as screen snapshots that relate to the operations performed via the supply chain.

**STEP 6 Questions and Reflections Concerning this Database Project**

Now that you have completed this lab project, review the questions below to reflect on the procedures and settings that you utilized as you followed the steps to complete the project. Place your responses in your lab submittal document.

**(1)** Explain how your supply chain schema would handle the promotion of a product. For example, this week only the distributor is offering a 10 for $ 10 sale on certain office supplies.

**(2)** Explain how you would use your database schema to alert the distributor to replenish the warehouse.

**(3)** If you were designing some PL / SQL triggers for this application, list at least five triggers that you would design.

**(4)** One of the foundations of the supply chain is operations, which includes

forecasting, Just in Time ( JIT ) , quality, inventory management and information system design.

Considering a restaurant supplies franchise, comment on how this enterprise could effectively utilizes these categories of operations.

**(5)** Suppose the products ordered by Customer X have embedded RFID labeling device(s) . How would your database schema be used to track the position / location of the products in the chain and to assist in quicker delivery?