BIS 360
Exercise #2
Conceptual Data Modeling

I. Objective

This assignment will familiarize you with conceptual data modeling by using one of the modern techniques--Entity-Relationship Diagramming (ERD)--in Oracle Designer.

You are expected to apply all concepts and symbols introduced in the textbook and lectures to identify the data needs (requirements) for the mini case addressed in this assignment. You should consider all entities and relationships mentioned in this case in your final ERD. To ensure your success in designing your ER model, you are required to produce a set of deliverables that include:

1. attribute and information tables
2. a bubble-shaped ERD created by Microsoft PowerPoint (or a drawing in Word)
3. an ERD created in Oracle Designer.

II. Mini Case Description

Kalamazoo Imports, Inc. (KII) is an international product distribution firm located in Kalamazoo, Michigan. The firm buys products from international markets and then resells them to department stores (e.g., a customer) in the United States. Currently, the company has a paper-based system to manage its product acquisition and sales records. Obviously, the current system is prone to errors and slow to respond to inquiries from each regional department store.

KII is hiring you as a system analyst to develop a data model using an ERD to improve the process.

To shorten your requirement analysis, relevant departments at KII have provided the following information:

- **Supplier**: A product supplier’s information includes a unique supplier ID, supplier name (e.g., a company name), address, phone, and fax number. While a supplier may have several phones and fax numbers, at present only one phone and one fax number is recorded on the company information. The required information about a supplier includes ID, name, address, and phone.

- **Purchasing Agent**: The person who handles the purchase between KII and potential suppliers. The information about a purchasing agent includes his/her name (not unique), phone number, and e-mail address. Since the name is not unique, KII creates a unique personal ID for each purchasing agent. The required information for a purchasing agent includes ID and name.
- **Product**: A product ordered by KII from potential suppliers. The information about a product includes product identifier, name, description, and quantity-on-hand. The required information for a product includes product ID and name.

- **Purchase**: A purchase order between KII and a particular supplier. The purchase order information includes its unique order number, order date, and arrival date. Certainly, it also includes relevant information about the supplier, product, and the purchasing agent who handles the purchase order. *Note that some of this data is to be included via relationships between the related entities.* Once a purchase order is made, the following information must be provided: order number, order date, and order quantity.

- **Line Item**: A line item represents a particular product ordered in a given purchase order. The basic information about a line item includes an item number, quantity ordered, and unit cost. A line item must be related to a purchase order and a particular product. The required information for a line item includes item number and quantity ordered.

- **Customer**: A customer is a potential department store to which KII sells products. The information about a customer includes customer name (e.g., a company name), address, and phone. The required information about a customer includes customer name and phone.

- **Sales List**: This list includes all potential customers for a particular product. The list is updated regularly. It contains information about the customer, product, and the last transaction date on which the customer made a purchase of that product. If there is no transaction between the customer and product, then the date is left empty.

Note that the above description has addressed only the "entities" involved in the data model. Additional information about the relationships between entities is summarized below:

- A purchase order is issued to a particular supplier. A supplier may be involved in one or several purchase orders.

- A purchase order may order one or several products. A product may or may not appear on a particular purchase order. Certainly, a product could be purchased by several purchase orders. The relationship between purchase and product, in fact, is reinforced by entity **Line Item**.

- A purchase order is handled by only one purchasing agent. An agent may process one or several purchase orders.

- A product could be sold to one or several customers, and a customer might be interested in buying one or several products.
III. How to Complete This Exercise

To ensure that you successfully accomplish this exercise, you are required to follow the procedure below to guarantee complete analysis and design work:

1. **Develop an attribute and information table for each entity.** Use the information given above, you should develop a table (as shown below) for each entity:

   **Table 1. Attributes and Information of entity Supplier**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Data type, length and precision</th>
<th>Optional</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>SuppID</td>
<td>Integer</td>
<td>No</td>
<td>The unique identifier of a supplier</td>
</tr>
<tr>
<td>Name</td>
<td>VARCHAR(50)</td>
<td>No</td>
<td>The name of the supplier</td>
</tr>
<tr>
<td>Address</td>
<td>VARCHAR(150)</td>
<td>No</td>
<td>The address of the home office</td>
</tr>
<tr>
<td>Phone</td>
<td>CHAR(10)</td>
<td>No</td>
<td>The contact phone</td>
</tr>
<tr>
<td>FaxNumber</td>
<td>CHAR(10)</td>
<td>Yes</td>
<td>The fax number</td>
</tr>
</tbody>
</table>

   **Note:** Although you must define all attributes, you have full freedom to define the data type, length, and precision for each attribute. However, whether an attribute is optional will be determined based on the information given in the case.

   You should develop a table for each entity addressed in the mini case.

2. **Use Microsoft PowerPoint (or a drawing in Word) to develop an ERD.** To pave the way for your modeling work in Oracle Designer, it’s helpful to plot out an ERD. For a better presentation you should use PowerPoint or Word to draw this diagram. The diagram should mimic the diagram in Figure 10-17 (page 333) in your textbook. Remember, the better the diagram you have developed, the easier it will be for you to go through the modeling process in Oracle Designer.

3. **Use Oracle Designer to draw the ERD.** This is the final step of this exercise. Make sure you have your ER diagram (developed in step 2) handy, and follow the steps below to complete this exercise:

   Click **Start - Programs - Oracle Designer 6.0 - Oracle Designer** to access to the Oracle server. Remember you should provide the following info when you sign in:

   Username: 
   Pxx (assigned by me)
Password: Xxdddd
Connect String: bis360

(xx: the first two letters of your last name dddd: the last four digits of your student ID)

Once you are connected, choose the application system created for your use. (There are two choices, one for your own use, and one for the project.)

Draw your ERD in your Oracle Designer application. Save your diagram as Exer2 within your application.

**IV. Deliverables**

You should turn your assignment in the following manner:

1. Use a cover page exactly like the one on the Exercise Webpage. Make sure that the only handwritten information is your signature. (5 points)

2. You should use Microsoft Word to develop a Word document (unifiedID-exercise2.doc) that contains:
   - The attribute and information table (labeled accordingly) for each entity that you have developed in Step 1 of Section III. (13 points)
   - The graphic ERD (created by Microsoft PowerPoint or a drawing in Word) developed in Step 2 of Section III. You should use cut-and-paste to insert your ERD into your Word document (21 points).
   - The computer ERD that you created in Oracle Designer. Again, you should use cut-and-paste to insert your ERD into your Word document (21 points).

3. Finally, staple these printouts together in the above order.

**V. Items of Note**

Note that you should keep all your modeling work in your personal account on the Oracle server. The ERD you included in your Word document should be identical to the one in your account. I will check these for consistency.

Make sure you come see me well before the due date if you’d like me to check your tables or graphic ERD. If you come to me on the morning the exercise is due with only tables, I’ll offer suggestions, but you probably won’t have enough time to do both the graphic and computer ERD by the end of the day.