# Stage 1 Project Requirements –Data Requirements and ERD

**Step 1):** (15 Points) Discuss information requirements for the database application, addressing the following points.

* Qdoba Mexican Eats is a chain of fast casual restaurants in the United States and Canada serving Mexican-style cuisine. For our project, the customers are mostly students and faculties as we are in the campus itself, they come here and can make their own meals by selecting ingredients and sauce and are charged accordingly.
* Basically, we are going to enhance the Inventory management system at Qdoba, because sometimes the supplies/inventory coming in are not ordered or sometimes quantity in hand is different from that of the quantity ordered or the materials that come are different from what was ordered. With this project we have implemented a proper inventory/supply management database to keep a track of this issue. We are also going to manage the delivery system by keeping a proper database to store the details which is useful in delivery of the orders.
* In our project we are maintaining a database for Qdoba, which includes the details for orders, the items that can be ordered, billing details, delivery details, employee information and the details for inventory and supplies. Since this is a restaurant we must keep track of the order details like what item has the customer ordered, do they want it to be delivered or not, accordingly the bill will be generated and if the customer has some discount coupons they can even redeem it, not all customers have the coupons, so the details will be saved only for the customers who have them. These orders will be taken by employees standing on the cash register, according to their shifts, the employee will be having their own details and departments along with this where their shifts and hourly rates are defined. One employee can perform only task depending on their designation and shifts. We will be maintaining the inventory and supply information as well, the inventory can be ordered or modified by specific department, not all employees have the access to order inventory, it must be routed by the department.
* Detailed data requirements
* Database should record information of each order. For each order, database needs to store a unique OrderID, ItemID, Amount and OrderDate.
* Database needs to store what Items are ordered, which employee serves that order, the bill that is generated for the order and the orders can also have delivery. Not all orders can be delivered.
* The database needs to store information about each item, which includes a unique ItemID, ItemName, Price and addons if any.
* The database needs to store the delivery details for the orders, this will store a unique Delivery id, date and time of delivery, any special instructions, amount and customer information along with the delivery address.
* The database needs to store the information of all the employees working in Qdoba, which includes their unique EmployeeID, DeptId, Name, Gender, DataofBirth, Employment start date, Hourly pay rate, designation, address, contact no., supervisor’s details and their shift. Each of these employees belong to a department in the restaurant which has a unique Department Id and name.
* The database needs to store which employee belongs to a department
* The database should also store the Inventory and supply information, which can be ordered by department only. It needs to store the unique MaterialID, name, Date of order, Price of the material, quantity ordered, and quantity received.
* The dataset needs to store the billing information for each of the orders, it needs to store a unique Billno. Date, amount and coupon details.

**Note – Please find the attached excel sheet for the tables**

**Step 2: -**

**ER Diagram: -**

**A picture containing text, map

Description generated with very high confidence**

**Relational Schema: -**

**A close up of a map

Description generated with very high confidence**

**Step 3: -**

1. **Convert all entities and get: -**

Department: (DeptID, DeptName)

Order: (OrderID, Amount OrderDate) // ItemID

Item: (ItemID, ItemName, Price, AddOns)

Delivery: (DeliveryID, Time, Instructions Date, CustomerName, CustomerPhone, Amount, DeliveryAddress)

Bill: (BillNo, Amount, Date, Coupon)

Employee: (EmployeeID, LName, FName, Gender, DOB, StartDate, HourlyRate, Designation, Address, PhoneNo, Supervisor, Shift) // DeptID

Inventory/Supply: (MaterialID, MaterialName, DateOfOrder, Price, QuantityOnHand, Ordered)

1. **Convert all relationships: -**

* **Employee Serves Order (one to many)**

Order: (OrderID,Amount, OrderDate, EmployeeID)

Foreign Key: - EmployeeID

* **Order has Items (many to many)**

OrderDetails: - (OrderID, ItemID)

* **Department Orders Inventory (One to one)**

Each inventory must be order by department but it’s not necessary that each department orders inventory.

Inventory/Supply: (MaterialID, MaterialName, DateOfOrder, Price, QuantityOnHand, Ordered, DeptID)

Foreign Key: - DeptID

* **Department belongs to employee (one to many)**

Employee: (EmployeeID, LName, FName, Gender, DOB, StartDate, HourlyRate, Designation, Address, PhoneNo, Supervisor, Shift, DeptID)

Foreign Key: DeptID

* **Bill for Order (one to one)**

Bill: (BillNo, Amount, Date, Coupon, OrderID)

Foreign Key: OrderID

* **Order has Delivery (One to One)**

Delivery: (DeliveryID, Time, Instructions Date, CustomerName, CustomerPhone, Amount, DeliveryAddress, OrderID)

Foreign Key: OrderID

1. **Final Conversion Result:**

* Department: (DeptID, DeptName)
* Order: (OrderID, Amount OrderDate, EmployeeID) **Foreign Key: - EmployeeID**
* Item: (ItemID, ItemName, Price, AddOns)
* Delivery: (DeliveryID, Time, Instructions Date, CustomerName, CustomerPhone, Amount, DeliveryAddress, OrderID) **Foreign Key: OrderID**
* Bill: (BillNo, Amount, Date, Coupon, OrderID) **Foreign Key: OrderID**
* Employee: (EmployeeID, LName, FName, Gender, DOB, StartDate, HourlyRate, Designation, Address, PhoneNo, Supervisor, Shift, DeptID) **Foreign Key: DeptID**
* Inventory/Supply: (MaterialID, MaterialName, DateOfOrder, Price, QuantityOnHand, Ordered, DeptID) **Foreign Key: - DeptID**
* OrderDetails: - (OrderID, ItemID) **Foreign keys: OrderID, ItemID**

1. **Normal Form Determinations:**

All tables are in BCNF.

1. **Result after Normalization:**

* Department: (DeptID, DeptName)
* Order: (OrderID, Amount OrderDate, EmployeeID) **Foreign Key: - EmployeeID**
* Item: (ItemID, ItemName, Price, AddOns)
* Delivery: (DeliveryID, Time, Instructions Date, CustomerName, CustomerPhone, Amount, DeliveryAddress, OrderID) **Foreign Key: OrderID**
* Bill: (BillNo, Amount, Date, Coupon, OrderID) **Foreign Key: OrderID**
* Employee: (EmployeeID, LName, FName, Gender, DOB, StartDate, HourlyRate, Designation, Address, PhoneNo, Supervisor, Shift, DeptID) **Foreign Key: DeptID**
* Inventory/Supply: (MaterialID, MaterialName, DateOfOrder, Price, QuantityOnHand, Ordered, DeptID) **Foreign Key: - DeptID**
* OrderDetails: - (OrderID, ItemID) **Foreign keys: OrderID, ItemID**