BUAN 6320 DATABASE FOUNDATIONS

GROUP 6

HOMEWORK 4

DATA REQUIREMENTS

Buy Parts

· TTI rented several warehouses to hold its inventory.

· They purchased different types of spare parts.

TTI entered into contracts with manufacturers to obtain spare parts. They placed multiple purchase orders of spare parts from manufacturers for different types of equipment. These spare parts are purchased and are stored in the rented warehouses as Inventory.

· The Database would contain Manufacturer information, Purchase Orders Information, Inventory and Warehouse information along with the Spare parts Information which are put in these Inventory/ Warehouses.

Assemble Equipment

· Assembled spare parts into different types of equipment, further categorized into packages based on the following,

There are 6 package types. Each of these 6 packages are assigned a price and categorized appropriately.

· The database would contain Equipment information and Package Details based on the assembly of individual equipment.

Sell Packages & Marketing

· Sales staff are hired to sell equipment and maintenance plans in different states (OK, LA, MS, AL, FL).

· Each assembled package is sold by a staff member for a commission.

As part of TTIs marketing campaign they introduced a lease plan for small and medium businesses where equipment can be returned in 3 years at no cost if signed up at the time of purchase. They

also employed various marketing campaigns through different channels/type. These vary based on location and have associated costs.

· The database would include Sales Orders, Sales Staff details, Lease information if the package was leased, and Marketing Campaign information for the organization.

Sell Maintenance Plans

Different types of maintenance plans are provided to customers on a subscription basis, associated with their orders.

Further, for customers who haven't purchased a maintenance plan can still send in equipment for repair at an appropriate price. Equipment are repaired by the repair staff.

· The database would contain information of the Maintenance Plans purchased for packages.

Customers

Types of customers - Small-and-Medium Businesses (SMB) and regular retail customers

Customers are organized by their category and what they have ordered/purchased.

· The database would contain Customer information and their relationships with Sales Orders

Return Equipment

· Customers may return equipment back to TTI. (When lease ends or regular returns)

· The database would contain Return Details for customers who may have returned equipment.

KEY ENTITIES AND THEIR RELATIONSHIPS:

1. A Manufacturer has many Purchase Orders; a Purchase Order has only one Manufacturer.

2. A Purchase Order has many Spare Parts. One spare part is related to only one P.O.

3. Every Purchase Order has a 1:1 relationship with Inventory (purchased).

4. Many Inventory(ries) are stored in a Warehouse. Every inventory is stored in only one warehouse.

5. Every Warehouse and Warehouse_Contracts record has a one-to-one relationship.

6. Many spare parts are used in an Equipment. Every Spare part is related to at most one equipment.

7. A Package contains many equipment. Each equipment is related to at most one package.

8. Many package types are related to a Marketing campaign. Each package type is related to only one Marketing campaign.

9. A Sales Order can contain many packages. A single package belongs to only one S.O.

11. Maintenance plans subscribed to have a one-to-one relationship with packages. Every package however need not have a maintenance plan associated with it.

12. One salesperson can be involved with many Sales Order; A single S.O. is related to only one salesperson.

13. Similarly, a Customer can be in many Sales Orders and every Sale Order involves only one customer.

15. One Sales order has relationship with one record of Lease Information table. But every sales order need not have a relationship with Lease information. (LeaseID is not mandatory under Sales order table)

16. Every Repair done has a relationship with one Equipment. Equipment has zero to many relationships with the repairs.

17. Every Equipment has zero or one relationship with Returns. A return can involve one or many equipment.

18. One Repair-staff is related to many Repairs and each repair event is related to only one repair-staff.

ASSUMPTIONS:

1. Manufacturer refers to the manufacturer of spare parts.

2. Many Inventories are stored in a warehouse. Every inventory is stored in only one warehouse.

3. Many spare parts are used in an equipment.

4. A Package contains many equipment. Each equipment is related to at most one package.

5. The packageType under PackageDetails has 6 different possibilities are related to a Marketing campaign. Individual equipment are sold as separate PackageType(s).

6. A Sales Order can contain many packages. A single Package belongs to only one S.O.

7. Every Package need not have a Maintenance plan associated with it.

8. A single Sales Order is related to only one salesperson.

9. TypeOfCustomer under Customers table refers to the two kinds of customers- individual consumers and SMBs.

10. A sales order has two sale-types: Actual sale and Lease sale. Each Sales Order has all the items as either actual sales or lease

11. Repairs are provided for all kinds of customers.

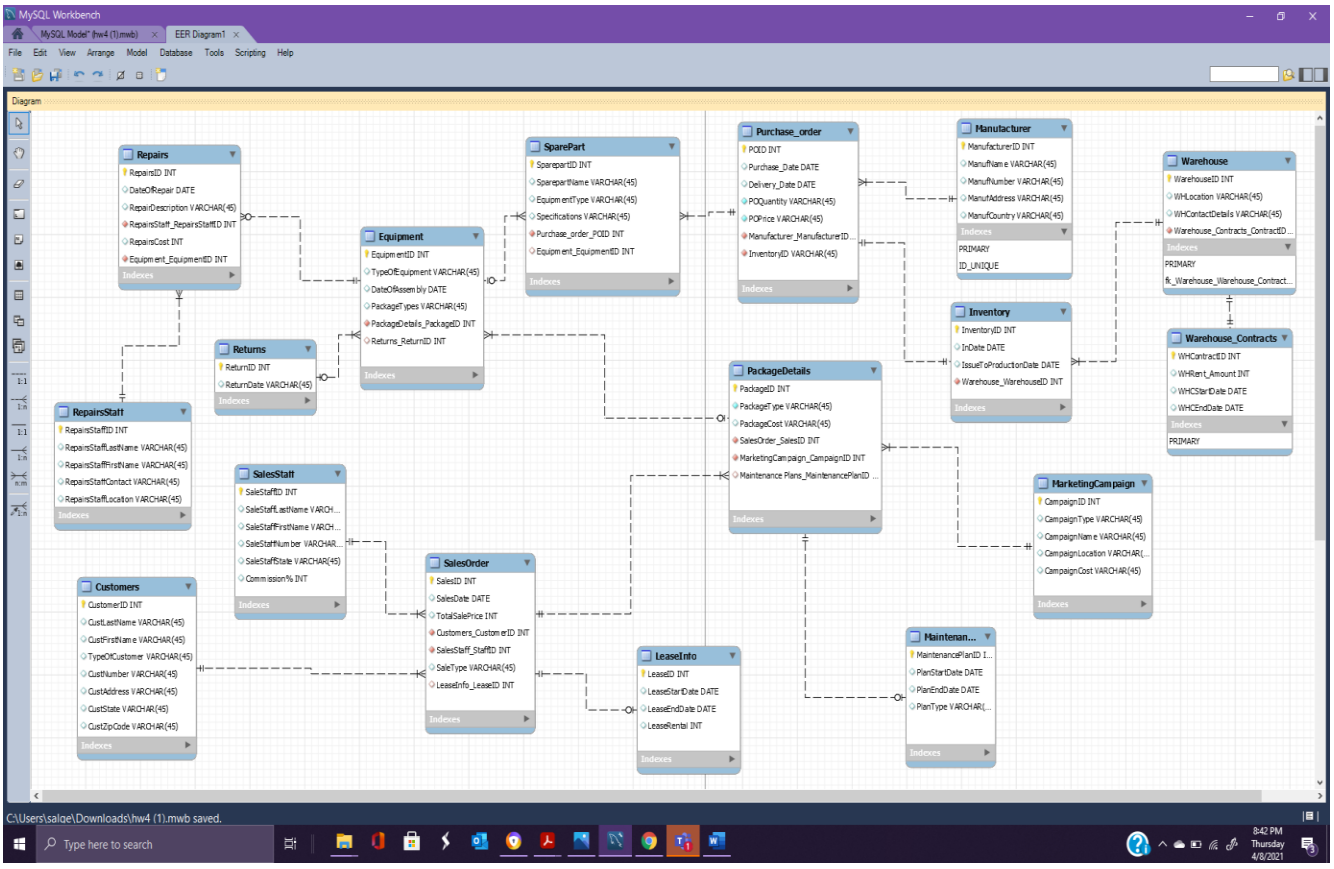
12. PackageIDs are created as needed when creating sales order.

13. When a spare part is added to the database, it is assumed to be a part of a single type of equipment (e.g., a power cable is pre-determined to be a part of a printer or a monitor before assembly).

14. Each record under the column “PackageTypes” in Equipment table contains one of the possible enumerations of types of packages an equipment could be placed into.

15. Package Cost is not dependent only on Package Type. Its also dependent on other factors such as location, specific contracts, etc.

DATA MODEL (ERD)



3NF Verification:

- All non-key columns have full functional dependency only on the Primary Keys.
- All attributes contain atomic values.
- Every entity has a single identifier that can uniquely identify each instance of the Entity.
- No transitive dependency. Every non key attribute is functionally dependent only on the primary key and not on any other non-key attribute.
- No calculated columns in the model.

Thus, the model satisfies the Third Normal Form.