IT214 – Database Management System

Project Title – Inventory Management System (IMS)

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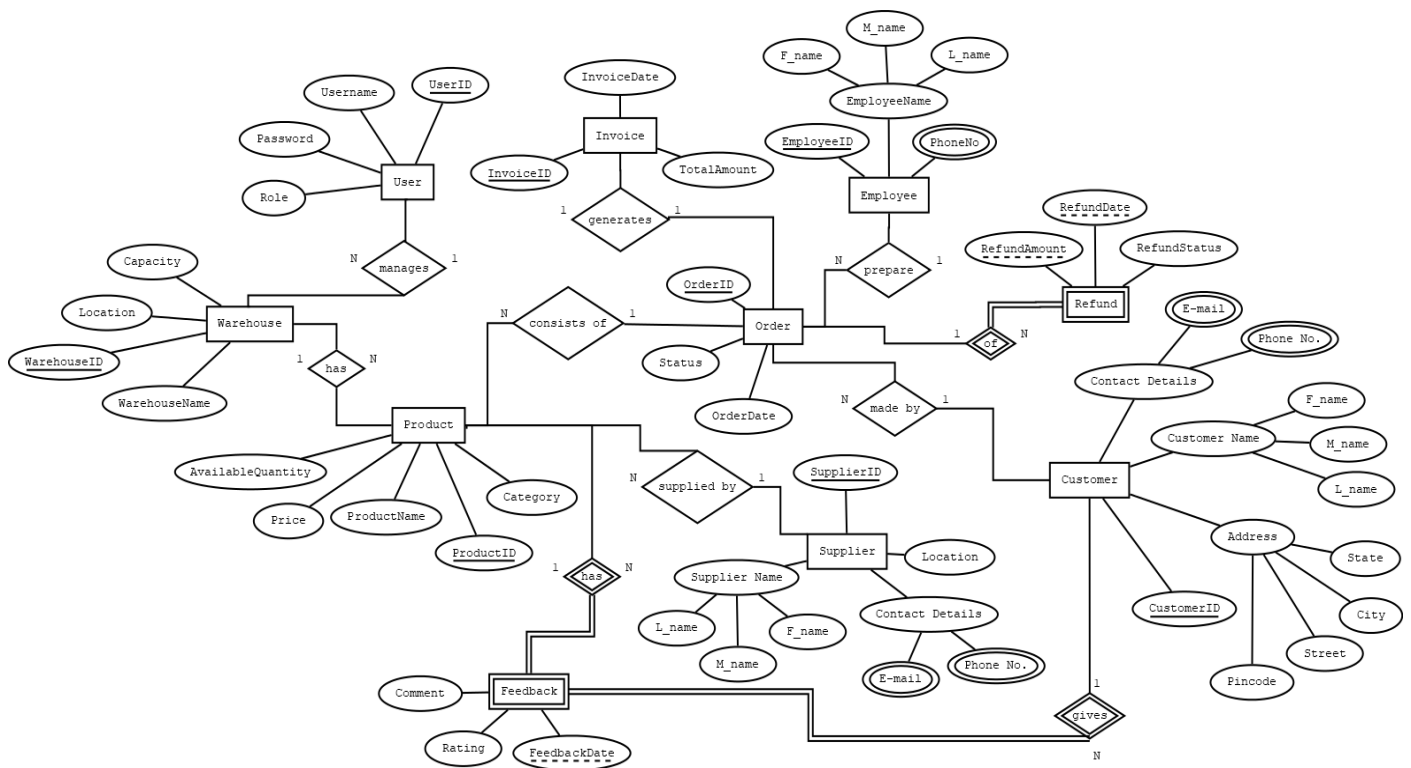
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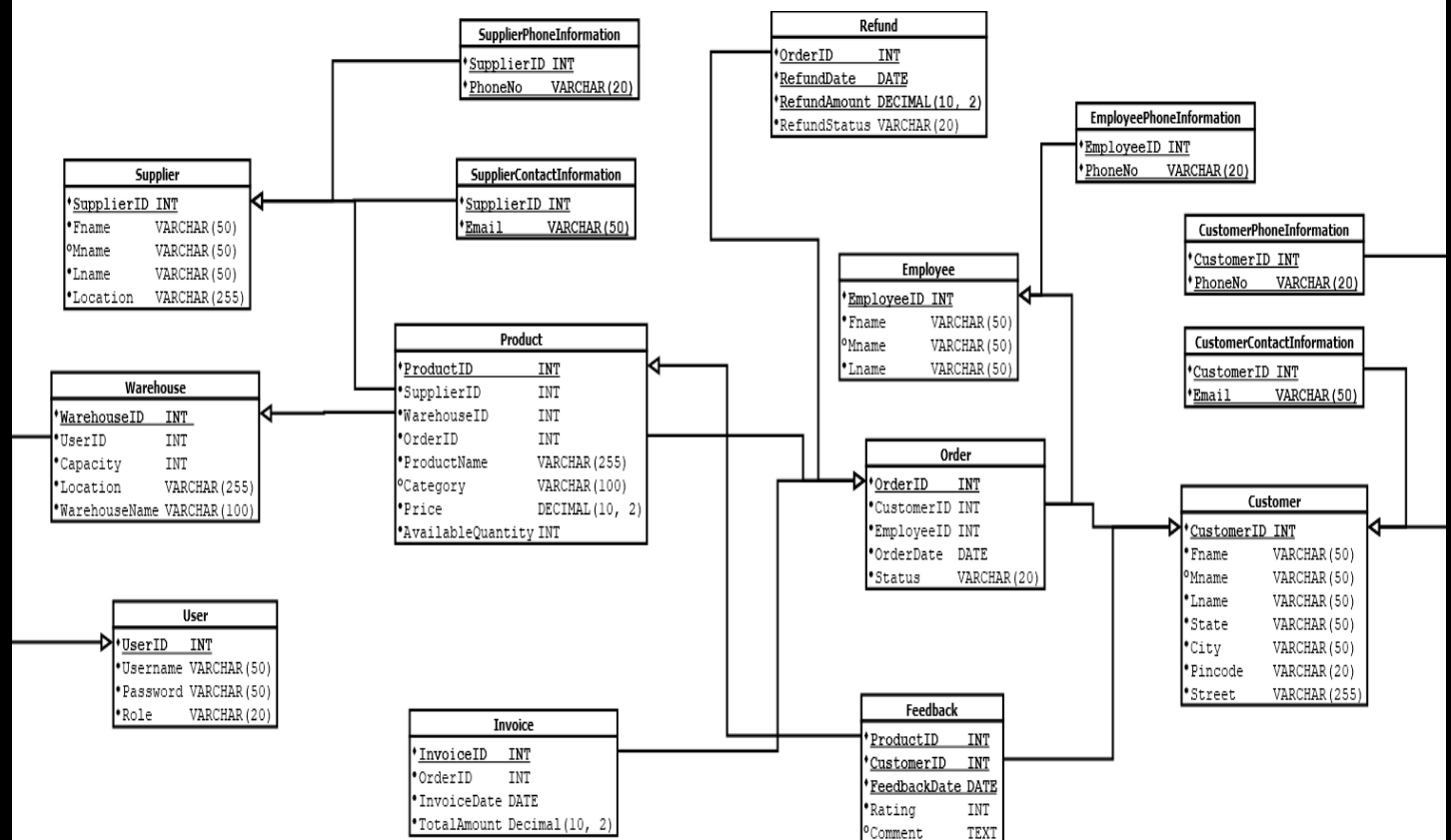Sujal Manavadariya (202201084)
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ER Diagram:

Relation Schema Diagram:

SupplierPhoneInformation
- SupplierID INT
- PhoneNo   VARCHAR(20)

Refund
- OrderID   INT
- RefundDate   DATE
- RefundAmount DECIMAL(10, 2)
- RefundStatus VARCHAR(20)

EmployeePhoneInformation
- EmployeeID INT
- PhoneNo   VARCHAR(20)

Supplier
- SupplierID INT
- Fname   VARCHAR(50)
- Mname   VARCHAR(50)
- Lname   VARCHAR(50)
- Location   VARCHAR(255)

SupplierContactInformation
- SupplierID INT
- Email   VARCHAR(50)

CustomerPhoneInformation
- CustomerID INT
- PhoneNo   VARCHAR(20)

Employee
- EmployeeID INT
- Fname   VARCHAR(50)
- Mname   VARCHAR(50)
- Lname   VARCHAR(50)

CustomerContactInformation
- CustomerID INT
- Email   VARCHAR(50)

Product
- ProductID   INT
- SupplierID   INT
- WarehouseID   INT
- OrderID   INT
- ProductName   VARCHAR(255)
- Category   VARCHAR(100)
- Price   DECIMAL(10, 2)
- AvailableQuantity INT

Warehouse
- WarehouseID   INT
- UserID   INT
- Capacity   INT
- Location   VARCHAR(255)
- WarehouseName VARCHAR(100)

Order
- OrderID   INT
- CustomerID INT
- EmployeeID INT
- OrderDate   DATE
- Status   VARCHAR(20)

Customer
- CustomerID INT
- Fname   VARCHAR(50)
- Mname   VARCHAR(50)
- Lname   VARCHAR(50)
- State   VARCHAR(50)
- City   VARCHAR(50)
- Pincode   VARCHAR(20)
- Street   VARCHAR(255)

User
- UserID   INT
- Username VARCHAR(50)
- Password VARCHAR(50)
- Role   VARCHAR(20)

Invoice
- InvoiceID   INT
- OrderID   INT
- InvoiceDate DATE
- TotalAmount Decimal(10, 2)

Feedback
- ProductID   INT
- CustomerID   INT
- FeedbackDate DATE
- Rating   INT
- Comment   TEXT

NORMALIZATION PROOFS:

1) For Relation Supplier:

- Attributes: SupplierID, Fname, Mname, Lname, Location

- FD set: {SupplierID} → {Fname, Mname, Lname, Location}

- Key: SupplierID

- Explanation: The left side of all functional dependencies in the minimal set is SupplierID, which is the primary key. Therefore, the Supplier table is in BCNF.

2) For Relation SupplierContactInformation:

- Attributes: SupplierID, Email

- Key: {SupplierID, Email}

- Explanation: Here both attributes are combined primary key, so relation is in BCNF form.

3) For Relation SupplierPhoneInformation:

- Attributes: SupplierID, PhoneNo

- Key: {SupplierID, PhoneNo}

- Explanation: Here both attributes are combined primary key, so relation is in BCNF form.

4) For Relation User:

- Attributes: UserID, Username, Password, Role

- FD set: {UserID} → {Username, Password, Role}

- Key: UserID

- Explanation: The left side of all functional dependencies in the minimal set is UserID, which is the primary key. Therefore, the User table is in BCNF.

5) For Relation Warehouse:

- Attributes: WarehouseID, UserID, Capacity, Location, WarehouseName

- FD set: {WarehouseID} → {UserID, Capacity, Location, WarehouseName}

- Key: WarehouseID

- Explanation: The left side of all functional dependencies in the minimal set is WarehouseID, which is the primary key. Therefore, the Warehouse table is in BCNF.

6) For Relation Customer:

- Attributes: CustomerID, Fname, Mname, Lname, State, City, Pincode, Street

- FD set: {CustomerID} → {Fname, Mname, Lname, State, City, Pincode, Street}

- Key: CustomerID

- Explanation: The left side of all functional dependencies in the minimal set is CustomerID, which is the primary key. Therefore, the Customer table is in BCNF.

7) For Relation CustomerContactInformation:

- Attributes: CustomerID, Email

- Key: {CustomerID, Email}

- Explanation: Here both attributes are combined primary key, so relation is in BCNF form.

8)For Relation CustomerPhoneInformation:

- Attributes: CustomerID, PhoneNo

- Key: {CustomerID, PhoneNo}

- Explanation: Here both attributes are combined primary key, so relation is in BCNF form.

9) For Relation Employee:

- Attributes: EmployeeID, Fname, Mname, Lname

- FD set: {EmployeeID} → {Fname, Mname, Lname}

- Key: EmployeeID

- Explanation: The left side of all functional dependencies in the minimal set is EmployeeID, which is the primary key. Therefore, the Employee table is in BCNF.

7) For Relation EmployeePhoneInformation:

- Attributes: EmployeeID, PhoneNo

- Key: {EmployeeID, PhoneNo}

- Explanation: Here both attributes are combined primary key, so relation is in BCNF form.

9) For Relation Order:

- Attributes: OrderID, CustomerID, EmployeeID, OrderDate, Status

- FD set: {OrderID} → {CustomerID, EmployeeID, OrderDate, Status}

- Key: OrderID

- Explanation: The left side of all functional dependencies in the minimal set is OrderID, which is the primary key. Therefore, the Order table is in BCNF.

9) For Relation Invoice:

- Attributes: InvoiceID, OrderID, TotalAmount, InvoiceDate

- FD set: {InvoiceID} → { OrderID, TotalAmount, InvoiceDate}

- Key: InvoiceID

- Explanation: The left side of all functional dependencies in the minimal set is InvoiceID, which is the primary key. Therefore, the Invoice table is in BCNF.

10) For Relation Product:

- Attributes: ProductID, SupplierID, WarehouseID, OrderID, ProductName, Category, Price, AvailableQuantity

- FD set: {ProductID} → {SupplierID, WarehouseID, OrderID, ProductName, Category, Price, AvailableQuantity}

- Key: ProductID

- Explanation: The left side of all functional dependencies in the minimal set is ProductID, which is the primary key. Therefore, the Product table is in BCNF.

11) For Relation Refund:

- Attributes: OrderID, RefundDate, RefundAmount, RefundStatus

- FD set: {OrderID, RefundDate, RefundAmount} → {RefundStatus}

- Key: {OrderID, RefundDate, RefundAmount}

- Explanation: The composite key {OrderID, RefundDate, RefundAmount} uniquely identifies each row. The RefundStatus is functionally determined by this key. Therefore, the relation is in BCNF.

12) For Relation Feedback:

- Attributes: ProductID, CustomerID, FeedbackDate, Rating, Comment

- FD set: {ProductID, CustomerID, FeedbackDate} → {Rating, Comment}

- Key: {ProductID, CustomerID, FeedbackDate}

- Explanation: The composite key {ProductID, CustomerID, FeedbackDate} uniquely identifies each row. The Rating and Comment are functionally determined by this key. Therefore, the relation is in BCNF.