# EER Modeling Diagram

User

Customer

.

1

1

Product

Have

Stock IN/OUT

M

1

Supplier

.

M

1

Have

# ER-Model Mapping to Database Relational Schema

* User (EmployeeID, FName, LName, Email, Role, PIN, Phone)
* Product (ProductID, ProductName, Description, Size, Category, Quantity)
* Supplier (SupplierID, SupplierName, Email, Phone, **ProductID**)
* Customer (CustomerID, CustomerName, Location, Email, Phone, **ProductID**)
* User\_StockIN/OUT\_Product (**EmployeeID, ProductID,** Quantity, Date, TransactionNumber, Comments, Type)

# Normalization

1. **1NF:**

All the attributes of all relations are atomic, as a result there are no nested relations. Also, we do not have multiple attributes in any relational schema and, there are not composite attributes; so, it is a First Normal Form.

1. **2NF:**

There are no Partial Functional Dependencies in relational schemas, every non-prime attribute has a Full Functional Dependency on the primary key; so, it is a Second Normal Form.

1. **3NF:**

There is no transitive functional dependency in any of the mentioned entities therefore it is in 3NF form already.

# Data Types (Domain) and Constraints

1. **Table: User**

*Attributes with data types and constraints:*

EmployeeID INT PRIMARY KEY

FName VARCHAR (20) NOT NULL

LName VARCHAR (20)

Email VARCHAR (50) UNIQUE NOT NULL

Role VARCHAR (10) VARCHAR CHECK (Role=’Manager’ OR Role=’Operator’)

PIN INT UNIQUE NOT NULL

Phone VARCHAR (50) NOT NULL

Every EmployeeID is unique and must be whole number. PIN should be whole number and unique for every employee and must not be null as it is required for sign in purposes.

1. **Table: Product**

*Attributes with data types and constraints:*

ProductID INT PRIMARY KEY

ProductName VARCHAR (20) NOT NULL

Description VARCHAR (20) NOT NULL

Size VARCHAR (20) CHECK (Size=’XS’ OR Size =’S’ OR Size =’M’ OR Size =’L’ OR Size =’XL’) NOT NULL

Category VARCHAR (20) CHECK (Category =’Pants’ OR Category =’Shirts’ OR Category =’Sweaters’ OR Category =’Coats’ OR Category =’Jackets’ OR Category =’Others’) NOT NULL

Quantity INT NOT NULL

Every ProductID is unique and must be whole number.

1. **Table: Supplier**

*Attributes with data types and constraints:*

SupplierID INT PRIMARY KEY

SupplierName VARCHAR (20) NOT NULL

Email VARCHAR (50) UNIQUE NOT NULL

Phone VARCHAR (50) NOT NULL

ProductID INT NOT NULL

CONSTRAINT Supplier FOREIGN KEY (ProductID) REFERENCES Product (ProductID) ON DELETE CASCADE

1. **Table: Customer**

*Attributes with data types and constraints:*

CustomerID INT PRIMARY KEY

CustomerName VARCHAR (20) NOT NULL

Location VARCHAR (50) NOT NULL

Email VARCHAR (50) UNIQUE NOT NULL

Phone VARCHAR (50) NOT NULL

ProductID INT NOT NULL

CONSTRAINT Customer FOREIGN KEY (ProductID) REFERENCES Product (ProductID) ON DELETE CASCADE

1. **Table: User\_StockIN/OUT\_Product**

*Attributes with data types and constraints:*

EmployeeID INT PRIMARY KEY

ProductID INT

Quantity INT NOT NULL

Date DATETIME NOT NULL

TransactionNumber UNIQUE NOT NULL

Comments VARCHAR (50)

Type VARCHAR (20) CHECK (Type =’IN’ OR Type =’OUT’ OR Type =’ADJUST’) NOT NULL

CONSTRAINT Stock\_Employee FOREIGN KEY (EmployeeID) REFERENCES User (EmployeeID) ON DELETE CASCADE

CONSTRAINT Stock\_Product FOREIGN KEY (ProductID) REFERENCES Product (ProductID) ON DELETE CASCADE