NOAKHALI SCIENCE AND TECHNOLOGY UNIVERSITY

Department of Computer Science & Telecommunication Engineering

Lab Report

COURSE TITLE: Database Management System Lab

COURSE CODE: CSTE-3106

Session: 2019-20

Year-03, Term-01

Submitted by:

Farman Arefin Tamim
ROLL: ASH2001043M

Submitted to:

Dr. Syful Islam
Assistant Professor
Department of Computer Science and Telecommunication Engineering

Noakhali Science and Technology University

Submission date: 20 November 2023

1. Introduction

The main aim of the project is the management of the database of the pharmaceutical shop. This project is insight into the design and implementation of a Pharmacy Management System. This is done by creating a database of the available medicines in the shop. The primary aim of pharmacy management system is to improve accuracy and enhance safety and efficiency in the pharmaceutical store. The aim of this project is to develop software for the effective management of a pharmaceutical store. We have developed this software for ensuring effective policing by providing statistics of the drugs in stock.

2. Database Schema:

2.1. ER Diagram for Pharmacy Management System:

- The systems consists of 7 entities (Company, Drugs,Users,Login,Message_History,Expiry,History_Sales
- **Attributes of Entities Company**(Name, Address, Phone)
  Drugs(Name, Type, Barcode, Code, Cost_Price,Selling_Price,Company_Name,Expiry,Production_Date,Expiration_Date)
  Users(Name, ID, Password,Salary,Phone,Address,Date_Of_Birth)
  Login(Name,Time,Type,Date)
  Expiry(Product_Name,Product_Code,Quantity_Remaining,Date_Of_Expiry)
  History_Sales(Name,Barcode,Time,Date,Amount,Price,Quantity,Dose,Type)

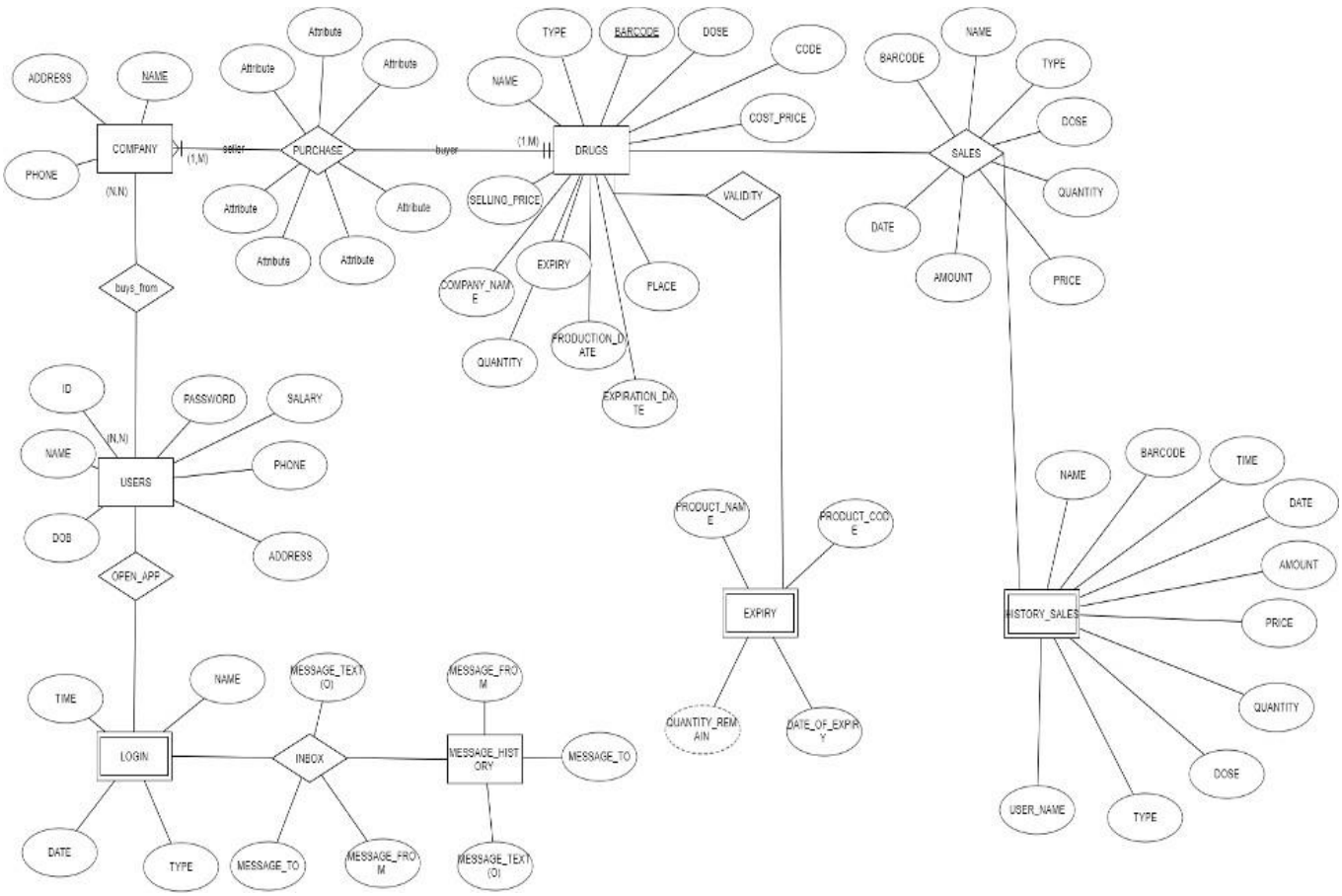

Figure: ER diagram for Pharmacy Management System

2.2 Schema relation for Pharmacy Management System:

Company(Company_ID,Name,Address,Phone)

Drugs(Drug_ID,Name,Type,Barcode,Code,Cost_Price,Selling_Price,*Company_ID,Expiry
Production_Date,Expiration_Date,Place)

Users(User_ID,Name,ID,Password,Salary,Phone,Address,Date_Of_Birth)

Login(Login_ID,*User_ID,Name,Time,Type,Date)

Expiry(Expiry_ID,Product_Name,Product_Code,Quantity_Remaining,Date_Of_Expiry)

History_Sales(Sale_ID,*Drug_ID,*User_ID,Time,Date,Amount,Price,Quantity,Dose,Type)

In this schema relation:

1. Company table:
   - The Company table represents the pharmaceutical companies involved in the system
   - The primary key is Company_ID,which uniquely identifies each company.
   - Other attributes include Name(company name),Address(company address) and Phone(contact number).
2. Drugs table:
   - The Drugs table stores information about thedrugs or medications managed in the system.
   - The primary key is Drug_ID,uniquely identifying each drug.
   - The Barcode attribute uniquely identifies each drug through a barcode.
   - Other attributes include Name(drug name),Selling_Price(selling price of the drug), Expiry(expiry date of the drug),Production_Date(date of production),Expiration_Date(date of expiration),and Place(location of the drug).
   - The Company_ID attribute is a foreign key referencing the Company table, establishing a one-to-many relationship between a company and the drugs produces.
3. Users table:
   - The Users table stores information about the users of the system.
   - The primary key is User_ID,uniquely identifying each user.
   - Other attributes include Name(user name),ID(user identification),Password(user password),Salary(user salary),Phone(user contact phone number),Address(user address),and Date_Of_Birth(user date of birth).
4. Login table:
   - The Login table keeps track of user login activity in the system.
   - The primary key is Login_ID,uniquely identifying each login entry.
   - The User_ID attribute is a foreign key referencing the Users table,connecting each login entry to the respective user.
   - Other attributes include Name(login name),Time(time of login),Type(type of login),and Date(date of login).

5. Expiry table:
    - The Expiry table stores information about drug expiration.
    - The primary key is Expiry_ID,uniquely identifying each entry.
    - Other attributes include Product_Name(name of the product),Product_Code(code of the product),Quantity_Remaining(quantity remaining before expiration),and Date_Of_Expiry(date of expiration).
6. History_Sales table:
    - The History_Sales table records the sales history within the system.
    - The primary key is Sale_ID,uniquely identifying each sale entry.
    - The Drug_ID attribute is a foreign key referencing the Users table,connecting each sale to the user who made the sale.
    - The User_ID attribute is a foreign key referencing the Users table,connecting each sale to the user who made the sale.
    - Other attributes include Time(time of the sale),Date(date of the sale),Amount(total amount of the sale),Price(price per unit),Quantity(quantity sold),Dose(dosage of the drug),and Type(type of the drug).

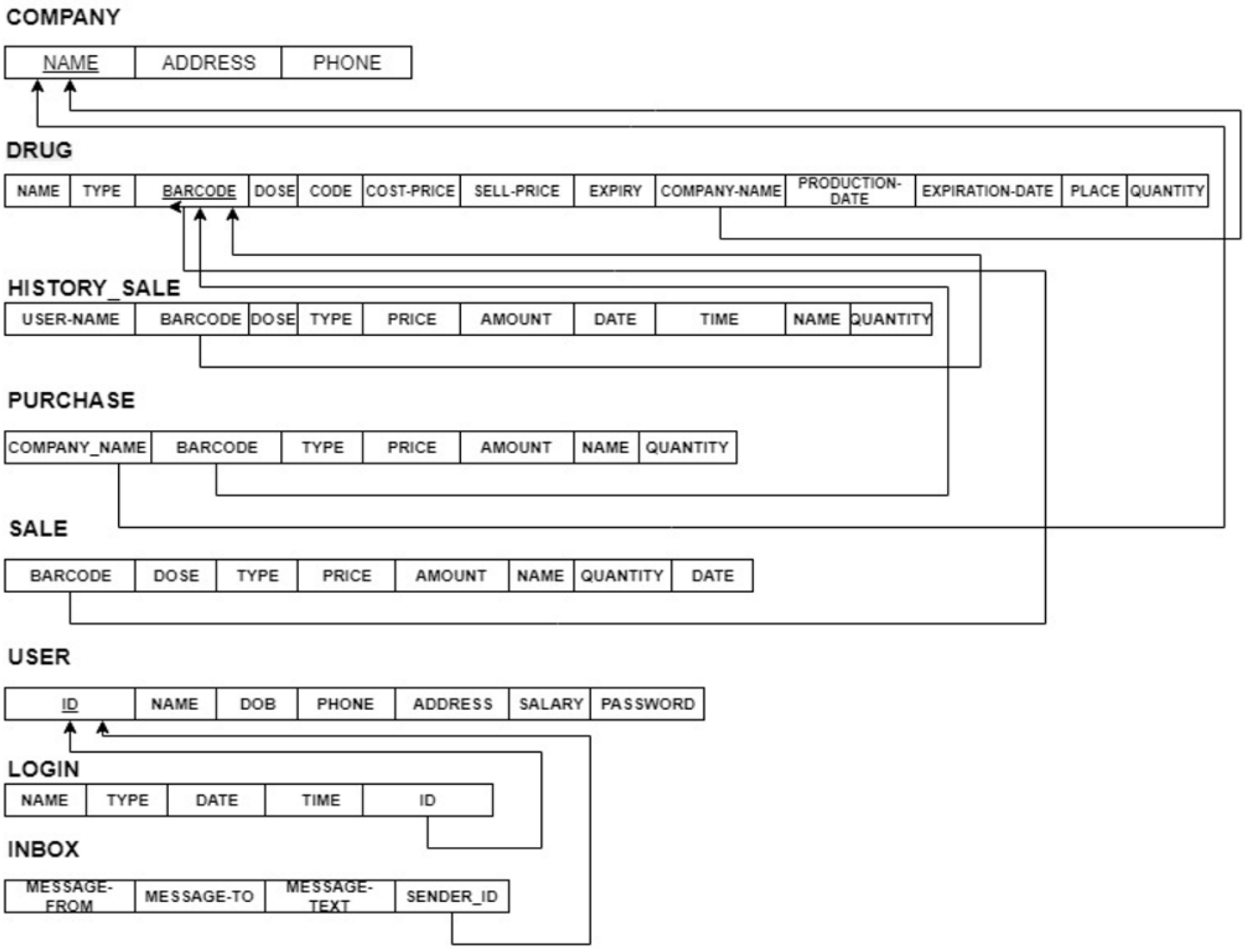

Figure: Schema diagram for Pharmacy Management System

First Normal Form:

To satisfy 1NF, we need to ensure that **each attribute contains only atomic values and there are no repeating groups.**

For example in the "Company" table a company have multiple Address showed in the table below:

Here is the First Normal Form of above table:

Company (Company_ID, Name, Address, Phone)

PK: Company_ID

Drugs (Drug_ID, Name, Type, Barcode, Code, Cost_Price, Selling_Price, Expiry, Production_Date, Expiration_Date, Place, Company_ID)

PK: Drug_ID

FK: Company_ID REFERENCES Company(Company_ID)

Users (User_ID, Name, ID, Password, Salary, Phone, Address, Date_Of_Birth) PK: User_ID

Login (Login_ID, User_ID, Name, Time, Type, Date) PK: Login_ID

FK: User_ID REFERENCES Users(User_ID)

Expiry (Expiry_ID, Product_Name, Product_Code, Quantity_Remaining, Date_Of_Expiry) PK: Expiry_ID

History_Sales (Sale_ID, Drug_ID, User_ID, Time, Date, Amount, Price, Quantity, Dose, Type)

PK: Sale_ID

FK: Drug_ID REFERENCES Drugs(Drug_ID) FK:

User_ID REFERENCES Users(User_ID)

Second Normal Form:

To achieve 2NF, we need to ensure that **each non-key attribute on the entire primary key.**

In the given schema:

- In Company table **Company_ID** is the primary key,and all non-key attributes(Company Name,Email,Adress,Date Of Birth,Phone) depend on the entire primary key.

Company (Company_ID, Name, Address, Phone)

PK: Company_ID

Drugs (Drug_ID, Name, Type, Barcode, Code, Cost_Price, Selling_Price, Expiry, Production_Date, Expiration_Date, Place, Company_ID)

PK: Drug_ID

FK: Company_ID REFERENCES Company(Company_ID)

Users (User_ID, Name, ID, Password, Salary, Phone, Address, Date_Of_Birth) PK:

User_ID

Login (Login_ID, User_ID, Name, Time, Type, Date) PK:
Login_ID

FK: User_ID REFERENCES Users(User_ID)

Expiry (Expiry_ID, Product_Name, Product_Code, Quantity_Remaining, Date_Of_Expiry)

PK: Expiry_ID

History_Sales (Sale_ID, Drug_ID, User_ID, Time, Date, Amount, Price, Quantity, Dose, Type)

PK: Sale_ID

FK: Drug_ID REFERENCES Drugs(Drug_ID)

FK: User_ID REFERENCES Users(User_ID)

- In Drugs table Company_ID is the primary key,and all non-key attributes(Drug_ID,Name,Type,Barcode,Code,Cost_Price,Selling_Price,Production_Date ,Expiration_Date,Place)
- In Users table Users_ID is the primary key,and all non-key attributes(User_ID,Name, ,ID,Password,Salary,Address,Phone,Date of Birth).

Therefore, the schema already satisfies 2NF.

Third Normal Form:

To achieve 3NF, we need to ensure that **there are no transitive dependencies, where a non- key attribute depends on another non-key attribute.**

A relation is in third normal form if it holds at least one of the following conditions for every non-trivial function dependency X → Y.

1. X is a super key.

2. Y is a prime attribute, i.e., each element of Y is part of some candidate key. In the given

schema:

- All the entities(Company_ID,Name,Address,Phone) do not have any transitive dependencies. Each
non-key attribute depends directly on the primary key.

Company (Company_ID, Name, Address, Phone)

PK: Company_ID

Drugs (Drug_ID, Name, Type, Barcode, Code, Cost_Price, Selling_Price, Expiry, Production_Date, Expiration_Date, Place, Company_ID)

PK: Drug_ID

FK: Company_ID REFERENCES Company(Company_ID)

Users (User_ID, Name, ID, Password, Salary, Phone, Address, Date_Of_Birth) PK: User_ID

Login (Login_ID, User_ID, Name, Time, Type, Date) PK: Login_ID

FK: User_ID REFERENCES Users(User_ID)

Expiry (Expiry_ID, Product_Name, Product_Code, Quantity_Remaining, Date_Of_Expiry) PK: Expiry_ID

History_Sales (Sale_ID, Drug_ID, User_ID, Time, Date, Amount, Price, Quantity, Dose, Type)

PK: Sale_ID

FK: Drug_ID REFERENCES Drugs(Drug_ID) FK:

User_ID REFERENCES Users(User_ID)

Fourth Normal Form (Boyce-Codd Normal Form): To achieve 4NF, we need to identify and remove any multivalued dependencies in the schema.

In the given schema, there are no evident multivalued dependencies present. Therefore, the schema remains in 3NF and does not have any explicit 4NF requirements.

3. SQL query for Employee management System Database:

```
CREATE TABLE `drugs` (
  `NAME` varchar(50) NOT NULL,
  `TYPE` varchar(20) NOT NULL,
  `BARCODE` varchar(20) NOT NULL,
  `DOSE` varchar(10) NOT NULL,
  `CODE` varchar(10) NOT NULL,
  `COST_PRICE` double NOT NULL,
  `SELLING_PRICE` double NOT NULL,
  `EXPIRY` varchar(20) NOT NULL,
  `COMPANY_NAME` varchar(50) NOT NULL,
  `PRODUCTION_DATE` date NOT NULL,
  `EXPIRATION_DATE` date NOT NULL,
```

```
  `PLACE` varchar(20) NOT NULL,
  `QUANTITY` int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
CREATE TABLE `expiry` (
  `PRODUCT_NAME` varchar(50) NOT NULL,
  `PRODUCT_CODE` varchar(20) NOT NULL,
  `DATE_OF_EXPIRY` varchar(10) NOT NULL,
  `QUANTITY_REMAIN` int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;


  CREATE TABLE `drugs` (
    `NAME` varchar(50) NOT NULL,
    `TYPE` varchar(20) NOT NULL,
    `BARCODE` varchar(20) NOT NULL,
    `DOSE` varchar(10) NOT NULL,
    `CODE` varchar(10) NOT NULL,
    `COST_PRICE` double NOT NULL,
    `SELLING_PRICE` double NOT NULL,
    `EXPIRY` varchar(20) NOT NULL,
    `COMPANY_NAME` varchar(50) NOT NULL,
    `PRODUCTION_DATE` date NOT NULL,
    `EXPIRATION_DATE` date NOT NULL,
    `PLACE` varchar(20) NOT NULL,
    `QUANTITY` int(11) NOT NULL
  ) ENGINE=InnoDB DEFAULT CHARSET=latin1;
  INSERT INTO `drugs` (`NAME`, `TYPE`, `BARCODE`, `DOSE`, `CODE`, `COST_PRICE`, `SELLING_PRICE`, `EXPIRY`, `COMPANY_NAME`, `PRODUCTION_DATE`, `EXPIRATION_DATE`, `PLACE`, `QUANTITY`) VALUES
  ('Novalo', 'Bills', 'fsdgjfihjorodsf', 'normal', '3d00', 2, 3, 'Available for use', 'Med_City', '2017-03-03', '2019-03-03', 'N-Right', 40),
  ('novafol', 'Bills', 'ftrkl432432md', 'normal', '2xaa', 33, 40, 'Available for use', 'Med_City', '2016-01-01', '2017-01-01', 'N-Left', 27);
```

```
CREATE TABLE `expiry` (
  `PRODUCT_NAME` varchar(50) NOT NULL,
  `PRODUCT_CODE` varchar(20) NOT NULL,
  `DATE_OF_EXPIRY` varchar(10) NOT NULL,
  `QUANTITY_REMAIN` int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;


CREATE TABLE `inbox` (
  `MESSAGE_FROM` varchar(20) NOT NULL,
  `MESSAGE_TO` varchar(20) NOT NULL,
  `MESSAGE_TEXT` varchar(200) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

4. Conclusion

In conclusion, the Pharmacy Management DBMS project achieves its goal of enhancing accuracy and efficiency in pharmaceutical store management. By creating a robust database, the system provides essential statistics, facilitating effective policing and informed decision-making. This software stands as a valuable tool for optimizing drug inventory and ensuring the safety and well-being of patients.