Database Design Phase Milestone 1: Mikes Sneaker Outlet

Project Members:
Maboku Seimela, 577943
Mamello Lelaka, 577497
Lehlohonolo Maleka, 577509

Belgium Campus ITversity
Database Design 361
Lecturer: Mr Desire Sundire

This phase of the project aims to highlight the proposed database design and Schema for Mike's Sneaker Outlet.

20 October 2023

Table of Contents

a.Introduction 3

b. Objectives and Problem Statement: 3

c. Conceptual Model: 4

i. ERD of proposed database: The below highlights the ERD's of Mike's Sneaker Outlet with all the cardinalities and key attributes and relationships 4

ii. Normalization Steps: 5

d. Logical Design: 6

e. Physical Design: 10

References 11

a.Introduction

Mike's Sneaker Outlet, nestled in the heart of Braamfontein, Johannesburg, is your go-to destination for top-tier branded sneakers at unbeatable discounts. Founded by Michael Sithole, the sneaker haven is a haven for sneaker enthusiasts seeking quality kicks without breaking the bank. The popup store was founded in September 2019. Mike is a 32-year-old man hailing from Durban who came to Johannesburg seeking new opportunities. While studying at the University of Johannesburg and looking to earn extra cash a friend introduced him to sneaker reselling. He then made the conscious decision to start recruiting customers on campus, who would possibly be interested in purchasing while also attracting sneakers enthusiasts and people in around Johannesburg who were keen on jumping on the opportunity to sell resell sneaker products. After he had made some good connections and saved some money from the profits, he makes from selling sneakers he decided to rent a shop in a local mall and sell the products there. After the few years he spent selling sneakers and making sales, he was able to recruit more than 20 distributers under his name and opened two new popup stands in another mall.

He makes orders from 3 different warehouses that are in Cape town. Due to Mike's busy schedule, he would like to be able to know when it's time for him to order new stock when there's a shortage of stock at his popup stands. When he makes orders for new products, he orders for his popups stands and distributers (the individuals who resell the sneakers). Each stand has one salesman that gets paid according to his/her monthly sales and the number of customers that they had sold the items to. His wish is to open up more popup shops and help decrease the number of unemployment rate in south Africa and also help the employed make extra cash by selling the products in their workplace and area.

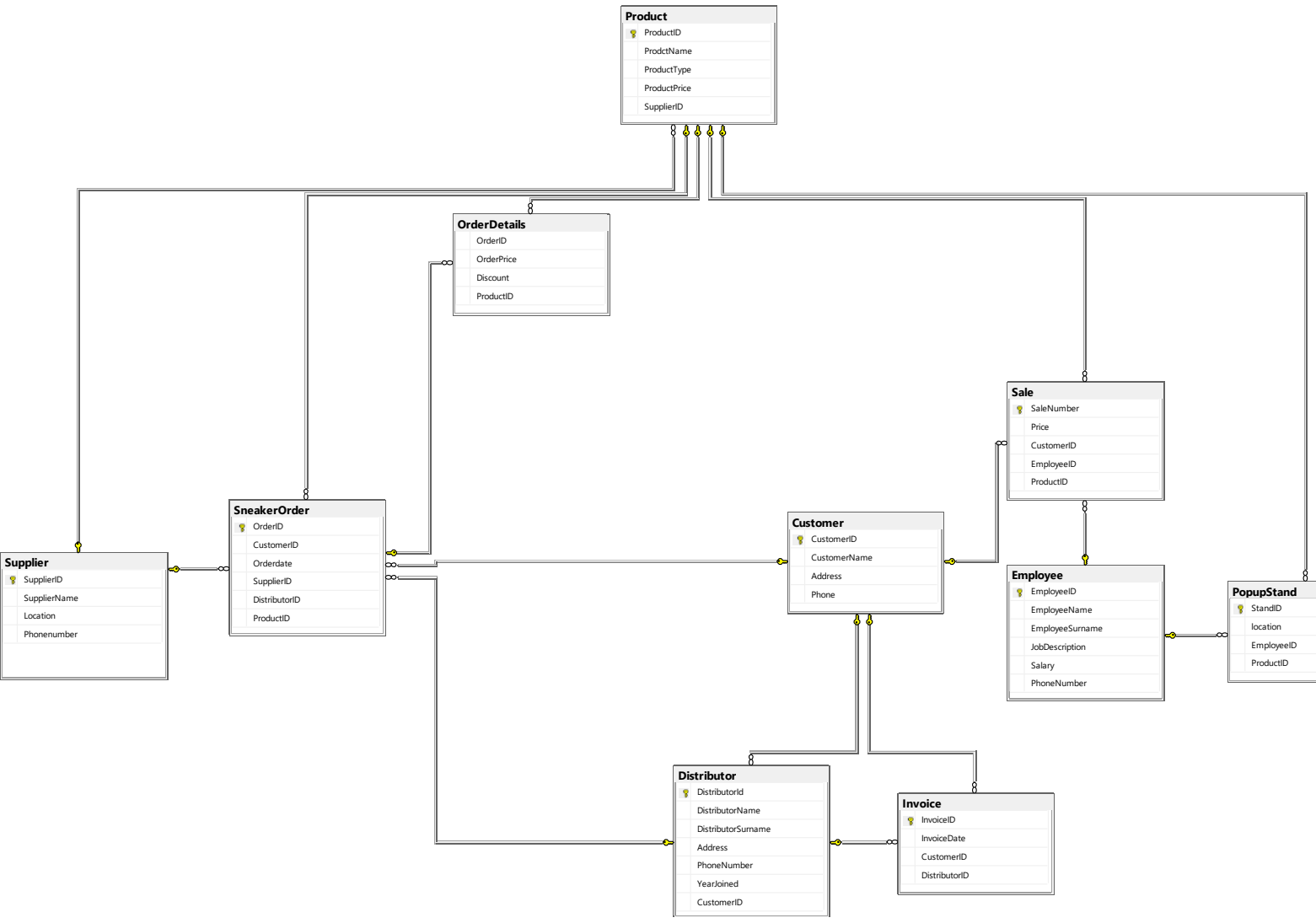
b. Objectives and Problem Statement:

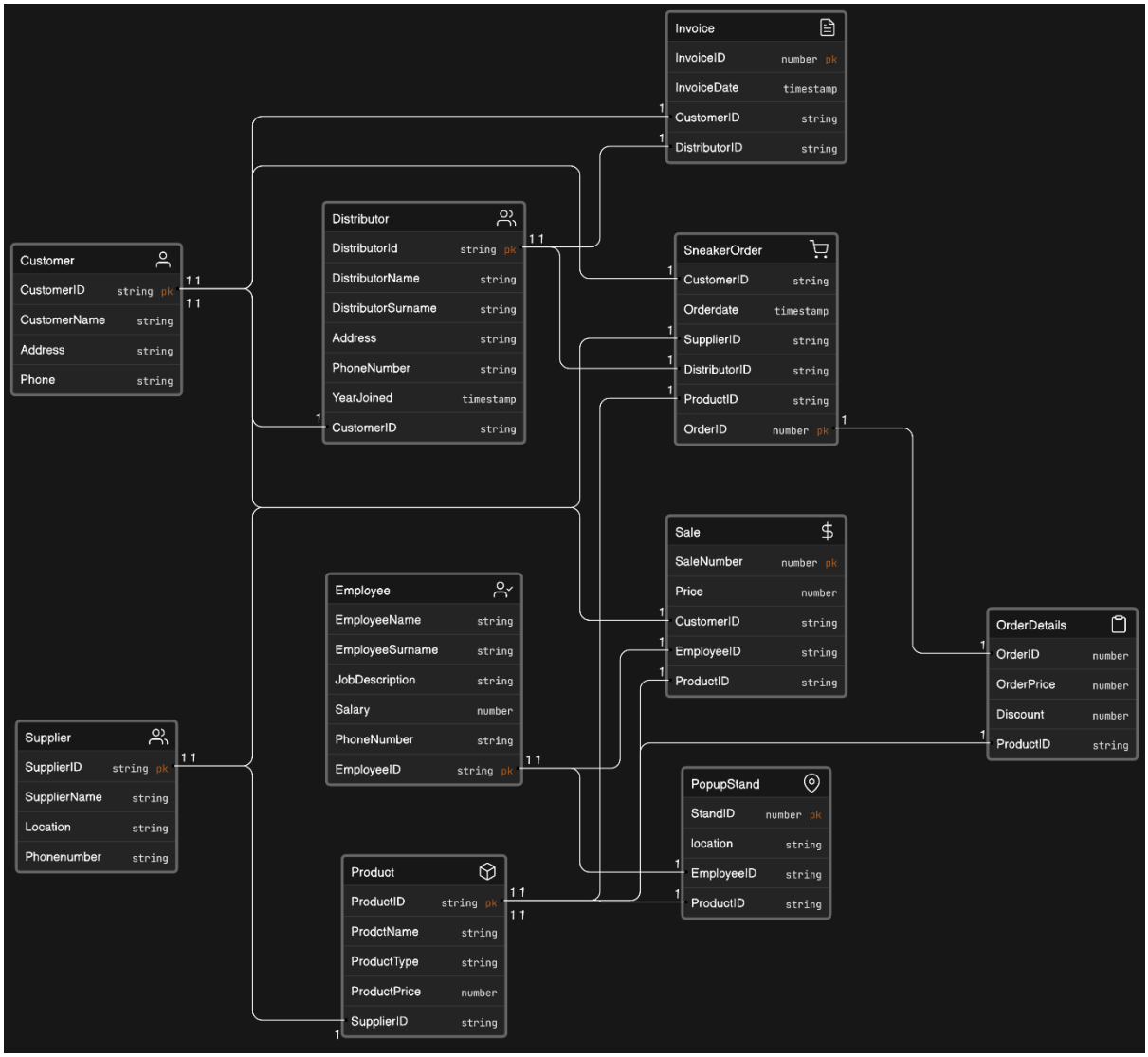
Mike would like the database to do the following:

- Delete customer records where a customer ID is specified.
- Change price of sneaker where Product ID is specified.
- Ensure that invoices don't have duplicated date.
- An identified area is Supplier Management: Can help Mike track product from suppliers, allowing mike to control and manage stock levels efficiently, reduce overstocking or under-stocking issues, and ensure he has the right products in his store and stands.

c. Conceptual Model:

i. ERD of proposed database: The below highlights the ERD's of Mike's Sneaker Outlet with all the cardinalities and key attributes and relationships





ii. Normalization Steps:

Normalization: Normalization of possible tables in database design normalized from 1st to 3rd

1NF: To eliminate repetitive data and duplicates that may lead to data redundancy.

Product; ProductType; ProductPrice; Supplier, Sale; Stand; Distributor; Employee; JobDescription; Customer; SneakerOrder; OrderPrice; Discount; invoice; PopupStand

2NF:
Product [ProductID; ProdctName; ProductType; ProductPrice; Supplier; Sale]

Distributor[DistributorId; DistributorName; DistributorSurname; Address;PhoneNumber;YearJoined;Customer]

Employee [EmployeeID; EmployeeName; EmployeeSurname; JobDescription; Salary; PhoneNumber]

SneakerOrder [OrderID; OrderPrice; Discount; invoice; Supplier; Date]

PopupStand [location; PopupStandID; EmployeeID; ProductID]

3NF:

Product Table:

Product[ProductID; ProdctName; ProductType; Productprice; SupplierID]

Sale Table:

Sale [SaleNumber; Price;ProductId; EmployeeID;CustomerID]
Supplier[SupplierID; Location; SupplierName; Phone number]

Distributor Table:

Distributor [DistributorID; DistributorName; DistributorSurname;Address;PhoneNumber;YearJoined; CustomerID]

Customer Table:

Customer[CustomerID; CustomerName; Address; PhoneNumber]

Employee Table:

Employee[EmployeeID; EmployeeName; EmployeeSurname; JobDescription; Salary; PhoneNumber]

SneakerOrder Table:

SneakerOrder [OrderID; SupplierID; Date; DistributorID]

OrderDetails [OrderID; ProductID; OrderPrice; Discount]

Invoice Table: To keep track of inventory and update stock received.

Invoice[InvoiceID; InvoiceDate; CustomerID; DistributorID]

d. Logical Design:

Tables with datatypes and constraints
Possible number of views: 2

The below highlights the database name and the list of tables in the database as well as the various datatypes, constraints, and established relationships in the database

Data Type	Description	Justification
CHAR(5)	Fixed-length character string with length 5	To store short codes or identifiers.
VARCHAR(40)	Variable-length character string with max length 40	To store names, descriptions, and other text data.
VARCHAR(60)	Variable-length character string with max length 60	To store the longer text data, such as addresses.
CHAR(24)	Fixed-length character string with length 24	For phone numbers or other short identifiers.
DATETIME	Date and time data	For date and time values.
MONEY	Numeric data type for currency values	To store monetary values.
INT	Integer data type	To store whole numbers (e.g., order IDs).
REAL	Single-precision floating-point number	To store fractional values (e.g., discounts).

MikesSneakerOutlet (Database name)

Customer: *Stores customer information, such as their name, address, and phone number.*

CustomerID CHAR(5) NOT NULL PRIMARY KEY,
CustomerName VARCHAR (40) NOT NULL,
Address VARCHAR (60) ,
Phone CHAR (24)

Supplier: *Stores information about suppliers, including their name, location, and phone number.*

SupplierID CHAR(5) NOT NULL PRIMARY KEY,
SupplierName VARCHAR (40) NOT NULL,
Location VARCHAR (60) ,
Phonenumber CHAR (24)

Distributor: *Stores distributor information, including name, address, phone number, year joined, and a foreign key reference to the Customer table.*

DistributorId CHAR(5) NOT NULL PRIMARY KEY,
DistributorName VARCHAR (40) NOT NULL,
DistributorSurname VARCHAR (40) NOT NULL,
Address VARCHAR (60) ,
PhoneNumber CHAR (24) ,
YearJoined DATETIME ,
CustomerID CHAR(5) FOREIGN KEY REFERENCES Customer(CustomerID)

Product: *Stores product information, including product name, type, price, and a foreign key reference to the Supplier table.*

ProductID CHAR(5) NOT NULL PRIMARY KEY,
ProdctName VARCHAR (40) NOT NULL,
ProductType VARCHAR (40) NOT NULL,
ProductPrice MONEY,
SupplierID CHAR(5)FOREIGN KEY REFERENCES Supplier(SupplierID)

SneakerOrder: *Records sneaker orders, including order date, and foreign key references to Customer, Supplier, Distributor, and Product tables.*

OrderID INT NOT NULL PRIMARY KEY,
CustomerID CHAR(5) FOREIGN KEY REFERENCES Customer(CustomerID),
Orderdate DATETIME NULL,
SupplierID CHAR(5)FOREIGN KEY REFERENCES Supplier(SupplierID),
DistributorID CHAR(5)FOREIGN KEY REFERENCES Distributor(DistributorID),
ProductID CHAR(5) FOREIGN KEY REFERENCES Product(ProductID)

Employee: *Stores employee details, such as name, surname, job description, salary, and phone number.*

EmployeeID CHAR(5) NOT NULL PRIMARY KEY,
EmployeeName VARCHAR (40) NOT NULL,
EmployeeSurname VARCHAR (40) NOT NULL,
JobDescription VARCHAR (40) NOT NULL,
Salary MONEY,
PhoneNumber CHAR(10))

Sale: *Records sales transactions, including sale number, price, and foreign key references to Customer, Employee, and Product tables.*

SaleNumber INT NOT NULL PRIMARY KEY, Price MONEY,
CustomerID CHAR(5) FOREIGN KEY REFERENCES Customer(CustomerID),
EmployeeID CHAR(5)FOREIGN KEY REFERENCES Employee(EmployeeID),
ProductID CHAR(5) FOREIGN KEY REFERENCES Product(ProductID)

OrderDetails: *Contains details of orders, including order price, discount, and foreign key references to SneakerOrder and Product tables.*

OrderID INT FOREIGN KEY REFERENCES SneakerOrder(OrderID),
OrderPrice MONEY,
Discount REAL NOT NULL,
ProductID CHAR(5) FOREIGN KEY REFERENCES Product(ProductID)

Invoice*:**Stores invoice information, including invoice date, and foreign key references to Customer and Distributor tables.*

InvoiceID INT PRIMARY KEY,
InvoiceDate DATETIME,
CustomerID CHAR(5) FOREIGN KEY REFERENCES Customer(CustomerID),
DistributorID CHAR(5)FOREIGN KEY REFERENCES Distributor(DistributorID)

PopupStand: *Records information about popup stands, including location, and foreign key references to Employee and Product tables.*

StandID INT NOT NULL PRIMARY KEY,
location varchar(20),
EmployeeID CHAR(5)FOREIGN KEY REFERENCES Employee(EmployeeID),
ProductID CHAR(5) FOREIGN KEY REFERENCES Product(ProductID)

Once the tables have been created data will be inserted into the tables and the tables can be modified allowing the retrieval of data from the database as specified by Mike’s requirements.

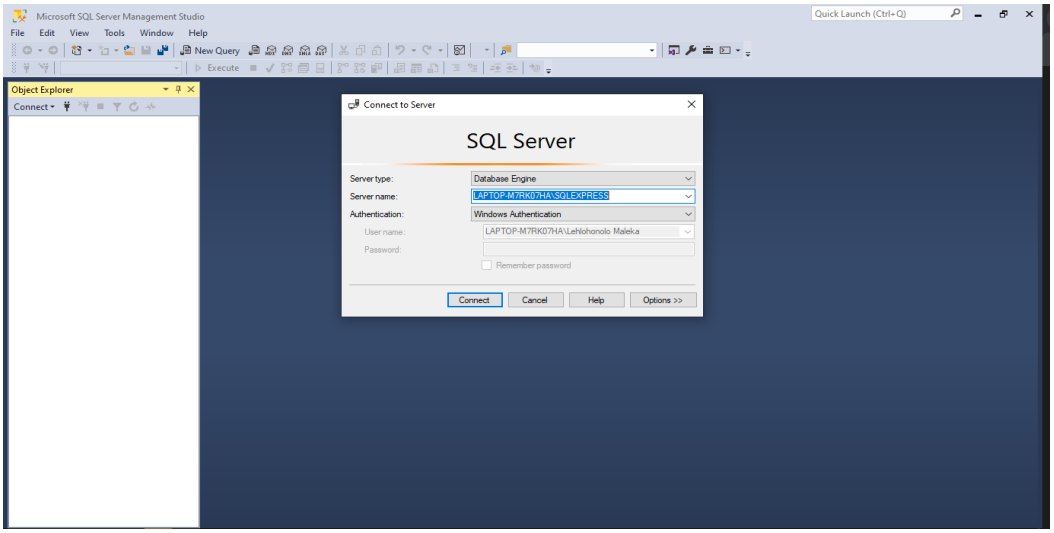
e. Physical Design:

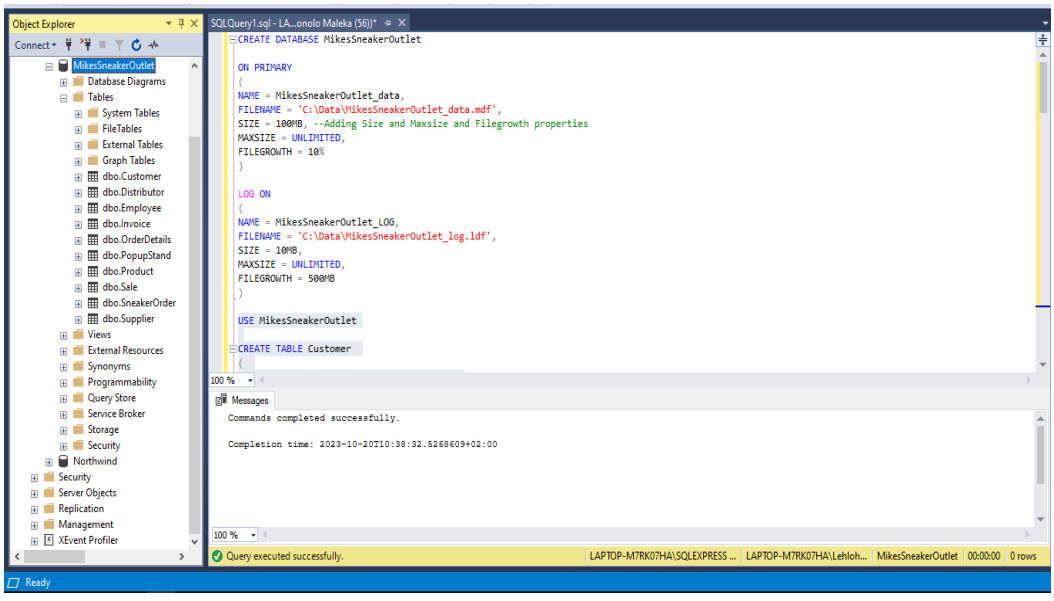
Security measures and authentication:

- The database will make use of *windows* authentication to ensure that it is accessible anywhere by end-users without restricting it to sa (system administrator) login and password.

Environment:

- SQL Server.
- The file will be backed up and the database will be saved as a .bak file to allow users to easily restore it on their system no matter what version of SQL they may have.
- The database will then be used to insert values into the tables and retrieve the data
- The below images highlight the environment, authentication, and objects in Mike's Sneaker Outlet database as well as the environment and file types and organisation when creating the database:





References

GeekforGeeks, 2022. *Logical Database.* [Online]
Available at: https://www.geeksforgeeks.org/logical-database/
[Accessed 19 October 2023].

Tonight, Study, 2022. *DBMS Database Models.* [Online]
Available at: https://www.studytonight.com/dbms/database-model.php
[Accessed 19 October 2023].

Tutorialspoint, 2022. *What are different types of DBMS languages?.* [Online]
Available at: https://www.tutorialspoint.com/what-are-different-types-of-dbms-languages
[Accessed 20 October 2023].