**Project: Database System for E-Commerce**

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**Overview**

This project was designed for a sporting goods company that uses a web-based front-end with phpMyAdmin as the database back-end.

**System Users**

Three different types of users will be able accessing the system: Public, Employees and Managers. A public user refers to the store’s customers. An employee refers to the salespeople that will be servicing the customers as well as reporting to the store’s management. A manager refers to the people managing the salespeople that are working in the stores.

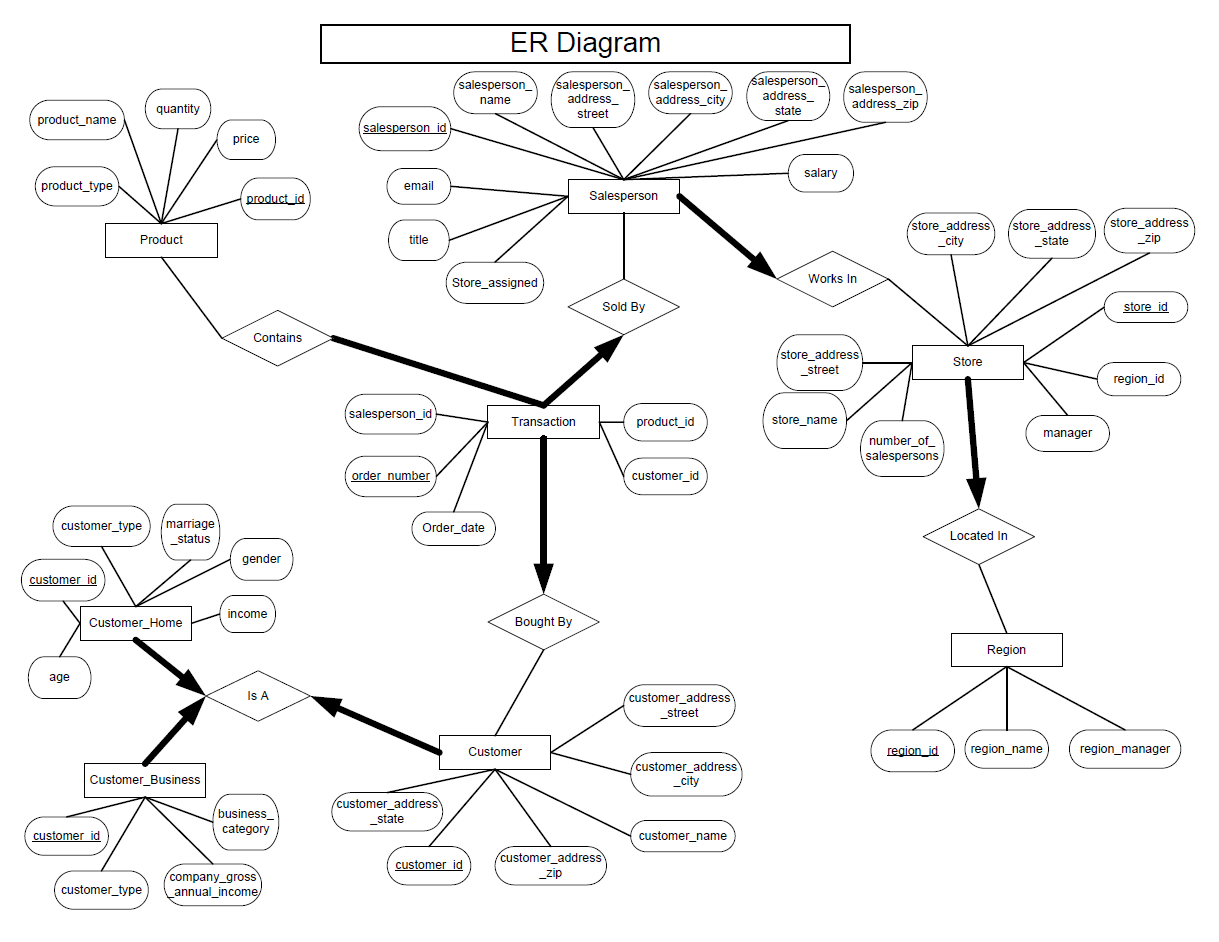
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| --- | --- |
| **User** | **Functions** |
| Public | Browse catalog  Search for a specific item by attribute |
| Employees | Add/edit customers  Add/edit transactions  Add/edit inventory |
| Managers | Add/edit/delete users from the system  View data aggregation reports |

**List of Assumptions**

The following is a list of assumptions that have been made regarding the system.

* A customer is free to make purchases at any store
* While all web forms are visible to all users, the functionality of certain forms is only available to users with the appropriate authorization

**ER Diagram**



**Relational Schema**

Customer (*customer\_id*: integer, *customer\_name*: string, *customer\_address\_street*: string,

*customer\_address\_city*: string, *customer\_address\_state*: string, *customer\_address\_zip*: string, *customer\_type*: string)

Customer\_Business (*customer\_id*: integer*, customer\_type*: string, *business\_category*: string, *business\_income*: integer)

Customer\_Home (*customer\_id*: integer, *customer\_type*: string, *marriage\_status*: string, *gender*: string, *age*: integer, *home\_income*: integer)

Salesperson (*salesperson\_id*: integer, *salesperson\_name*: string, *salesperson\_address\_street*: string, *salesperson\_address\_city*: string, *salesperson\_address\_state*: string, *salesperson\_address\_zip*: string, *email*: string, *title*: string, *salary*: integer, *store\_id*: integer)

Store (*store\_id*: integer, *store\_name*: string, *store\_address\_street*: string, *store\_address\_city*: string,

*store\_address\_state*: string, *store\_address\_zip*: string, *manager*: string, *number\_of\_salespersons*: integer, *region\_id*: integer)

Product (*product\_id*: integer, *product\_name*: string, *quantity*: integer, *price*: real, *product\_type*: string)

Region (*region\_id*: integer, *region\_name*: string, *region\_manager*: string)

Transaction (*order\_id*: integer, *order\_date*: date, *salesperson\_id*: integer, *product\_id*: integer, *customer\_id*: integer, *product\_quantity*: integer, *sales\_amount*: real)

Metadata (*table\_id*: integer, *table\_name*: string, *number\_of\_attributes*: integer, *number\_of\_foreign\_keys*: integer, *number\_of\_indexes*: integer)

**DDL Statements & Normal Forms**

CREATE TABLE Metadata

(table\_id INTEGER,

table\_name CHAR(30),

description CHAR (100),

number\_of\_fields INTEGER,

number\_of\_primary\_keys INTEGER,

number\_of\_foreign\_keys INTERGER,

number\_of\_indexes INTEGER,

PRIMARY KEY (table\_id))

The primary key table\_id functionally determines all attributes. There are no other FD’s. It is in BCNF.

CREATE TABLE Customer

(customer\_id INTEGER,

customer\_name CHAR(20),

customer\_address\_street CHAR(50),

customer\_address\_city CHAR(30),

customer\_address\_state CHAR(20),

customer\_address\_zip CHAR(10),

PRIMARY KEY (customer\_id))

The primary key customer\_id functionally determines all attributes. There are no other FD’s. It is in BCNF.

Note: Although infrequent, zip codes do not always determine the state or the city. One zip code can span multiple state and city borders.

CREATE TABLE Customer\_Business

(customer\_id INTEGER,

customer\_type CHAR(20),

business\_category CHAR(20),

business\_income INTEGER,

PRIMARY KEY (customer\_id),

FOREIGN KEY (customer\_id REFERENCES Customer))

The primary key customer\_id functionally determines all attributes. There are no other FD’s. It is in BCNF.

CREATE TABLE Customer\_Home

(customer\_id INTEGER,

customer\_type CHAR(20),

marriage\_status CHAR(10),

gender CHAR(6),

age INTEGER,

home\_income DOUBLE,

PRIMARY KEY (customer\_id),

FOREIGN KEY (customer\_id REFERENCES Customer))

The primary key customer\_id functionally determines all attributes. There are no other FD’s. It is in BCNF.

CREATE TABLE Product

(product\_id INTEGER,

product\_name CHAR(20),

quantity INTEGER,

price DOUBLE,

cost DOUBLE,

product\_type CHAR(20),

PRIMARY KEY (product\_id))

The primary key product\_id functionally determines all attributes. There are no other FD’s. It is in BCNF.

CREATE TABLE Salesperson

(salesperson\_id INTEGER,

salesperson\_name CHAR(20),

salesperson\_address\_street CHAR(50),

salesperson\_address\_city CHAR(30),

salesperson\_address\_state CHAR(20),

salesperson\_address\_zip CHAR(10),

email CHAR(50),

title CHAR(20),

salary INTEGER,

store\_id INTEGER,

PRIMARY KEY (salesperson\_id),

FOREIGN KEY (store\_id REFERENCES Store))

The primary key salesperson\_id functionally determines all attributes. There are no other FD’s. It is in BCNF.

Note: Although infrequent, zip codes do not always determine the state or the city. One zip code can span multiple state and city borders.

CREATE TABLE Store

(store\_id INTEGER,

store\_name CHAR(20),

store\_address\_street CHAR(50),

store\_address\_city CHAR(30),

store\_address\_state CHAR(20),

store\_address\_zip CHAR(10),

manager CHAR(50),

number\_of\_salespersons INTEGER,

region\_id INTEGER,

PRIMARY KEY (store\_id),

FOREIGN KEY (region\_id REFERENCES Region))

The primary key store\_id functionally determines all attributes. There are no other FD’s. It is in BCNF.

Note: Although infrequent, zip codes do not always determine the state or the city. One zip code can span multiple state and city borders.

CREATE TABLE Region

(region\_id INTEGER,

region\_name CHAR(30),

region\_manager CHAR(50),

PRIMARY KEY (region\_id))

The primary key region\_id functionally determines all attributes. There are no other FD’s. It is in BCNF.

CREATE TABLE Transaction

(order\_id INTEGER,

order\_date DATE,

salesperson\_ID INTEGER,

product\_ID INTEGER,

customer\_ID INTEGER,

product\_quantity INTEGER,

sales\_amount (double),

PRIMARY KEY (order\_id),

FOREIGN KEY (salesperson\_id REFERENCES Salesperson),

FOREIGN KEY (product\_id REFERENCES Product),

FOREIGN KEY (customer\_id REFERENCES Customer))

The primary key order\_id functionally determines all attributes. There are no other FD’s. It is in BCNF.

**Front-End & Back-End**

**System Implementation**

**System Limitations & Possible Improvements**