University of Arkansas at Little Rock

Designing and Implementing an Application Database System: Online Restaurant Ordering Database System

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Overview of Database System Report

The purpose of this report is to provide a complete documentation of the design and implementation of this project. The report demonstrates the use of basic theories of database system and design including using the high-level conceptual models such as ER models for database design, designing a relational database by ER-to-Relational mapping and basic to complex SQL programming. This document provides a detailed analysis of the approach and results of each phase throughout the project. It starts with the description of data requirement of the application database, followed by the conceptual design of the database in ER diagrams, relational schemas in 3NF, SQL codes for implementing the database, and sample queries and their results.

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Database System Objectives

The main purpose of the Online Restaurant Ordering Database System is to help a restaurant develop and manage a company database for day-to-day operations. The system should manage online to-go orders and customer data efficiently and effectively. Overall, the goal of the restaurant database system is to enable the business to grow and continue to meet the needs of all their customers and the customer orders.

- To build and maintain a high-speed and accurate system
- To create, read, update and delete information about customers and orders
- To provide a searchable database for all users who interact with the system
- To increase and maintain customer satisfaction
- To reduce cost of operation and increase profits
- To make communication between different parts of the system more efficient

Database Requirements

The online ordering restaurant system is organized into Customer accounts. Each ACCOUNT has a first and last name, phone number and a customer ID which is accessed and available with a customer's email address and password information. Also, each account keeps track of order history. Each LOCATION has an address, phone number, hours of operation for multiple days and times throughout the week. For every ORDER, there is a pickup date, order number, location order id and one or more menu items chosen. For each MENU, there is a menu item name, item number and a price. For every PAYMENT, there is a customer id, a payment type, an order number and an amount. For every PROMOTION, there is a promo name, code, and a discount.

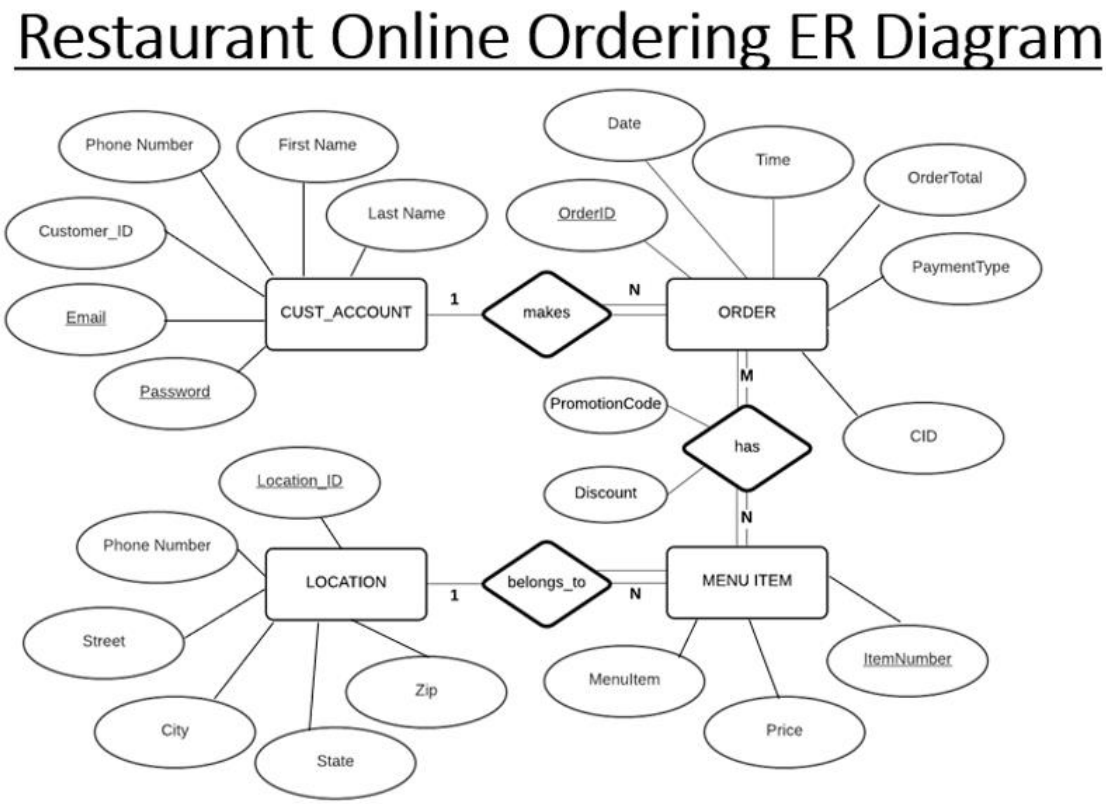
A customer account has multiple restaurant locations to select from. A customer account can place multiple orders. However, there is only one account for each order. For every order, there is only one menu to choose from. A customer account can make multiple payments, but for each payment, there is only one customer account. Also, for every promotion, only one promo code can be applied or redeemed for one online payment.

Pick an application database and provide a detailed description about the database. The real-world entities, their relationships, and some of constraints of this application database shall be specified at this stage. Your future design and implementation of the database shall comply with the description. Make sure you explain your assumptions and design goals.

Every single one of your research projects will have limitations. This section should be a detailed discussion of those that you faced through every step of the process. What problems did you face that would affect your results? Were there possible confounding variables you were unable to control for? What were the limits of your study design? Or in the data collection? These are all things you should consider when formulating this section for your poster.

System Design

Phase 2: *Design ER diagram for a DB application*



Phase 3: *Design relation schemas of the database*

CustomerAccount(Email, Password, CustomerID, Fname, Lname, PhoneNumber)

Order(OrderID, Date, Time, OrderTotal, PaymentType, CID)

MenuItem(ItemNumber, ItemName, Price, Location_ID)

Location(LocationID, Street, City, State, Zipcode, PhoneNumber)

OrderInfo(OID, ItemNum, PromoID)

PromoOrder(Promocode, Discount)

System Implementation

Phase 4: *Create and populate database*

```
create table CustomerAccount(
    Email varchar2(30),
    Customer_Password varchar2(30),
    Customer_Id number(9),
    First_name varchar2(30),
    Last_name varchar2(30),
    Phone_number number(10),
    constraint cust_pk primary key(Email, Customer_Password)
);
```

```
create table CustomerOrder(
    OrderID number(10),
    Customer_date varchar2(15),
    Customer_time varchar2(15),
    Order_total number(6,2),
    Payment_type varchar2(20),
    constraint ord_pk primary key(OrderID)
);
```

```
create table MenuItem(
    Item_number number(2),
    Item_name varchar2(20),
    Price number(6,2) check(Price >= 0.0),
    Location_ID number(5),
    constraint menuItem_pk primary key(Item_number),
    constraint locate_fk foreign key(Location_ID) references Location(LocationID) on delete cascade
);
```

```
create table Location(
    LocationID number(5),
    Street varchar2(30),
    City varchar2(30),
    State varchar2(30),
    Zipcode number(5),
    Restaurant_number number(10) unique,
    constraint locate_pk primary key(LocationID)
);
```

```
create table OrderInfo(
    OID number(10),
    ItemNum number(2),
    PromoID number(8) unique,
    constraint ordInfo_pk primary key(OID, ItemNum),
    constraint oid_fk foreign key(OID) references CustomerOrder(OrderID) on delete cascade,
    constraint item_fk foreign key(ItemNum) references MenuItem(Item_number) on delete cascade,
    constraint promo_fk foreign key(PromoID) references PromoCode(Promo_code) on delete cascade
);
```

```
create table PromoCode(
    Promo_code number(8),
    Discount number(2,2),
    constraint promo_pk primary key(Promo_code)
);

INSERT INTO CUSTOMERACCOUNT VALUES
('cxrobinson@yahoo.com', 'ualrInfoScience', 100018349, 'Charlessia', 'Robinson', 5013509899);
INSERT INTO CUSTOMERORDER VALUES
(9888133900, 'March 29, 2020', '6:45 p.m.', 35.25, 'Debit');
INSERT INTO LOCATION VALUES
(10055, 'West Markham', 'Little Rock', 'Arkansas', 72203, 5017348000);
INSERT INTO MENUITEM VALUES
(12, 'Chicken Alfredo', 10.05, 10055);
INSERT INTO PROMOCODE VALUES
(77773300, .15);
INSERT INTO ORDERINFO VALUES
(9888133900, 12, 77773300);
```

Phase 5: *Write application program*