Berndo's Shoe Store

CS323: Database Management / Database Systems

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Link to video: https://youtu.be/IDHT0OSEZDY

Stage 1: Scenario and Conceptual Design

Task 1.1

Company Background

A shoe enthusiast Bernd, owns a shoe store. His store, *Berndo's Shoe Store,* provides shoes ranging from sneakers to formal wear. Their motto is: You name it, we have it. The purpose of his establishment is to provide quality and affordable shoe wear for people.

Case Study

Bernd's conglomerate works based on a walk-in system and reservation system. The customer enters the shop and finds the shoe they want to buy. The cashier takes relevant details of the customer, looks up the shoes that are going to be bought, and also generates a bill for the customer. The customer can also reserve a shoe should they want to buy it but can't at that particular moment. The store also has inventory to keep track of the number of shoes it has.

Reason For This Project

During the summer, where there are a lot of events to go for, the stores are packed with a lot of customers. Bernd initially started his business using a file-based system to manage his stores' data and has realized some data inconsistencies due to the increasing number of customers that come through and the reservations made across the company's various branches. The file-based system has also resulted in data redundancy and has

caused several security issues for the company. Due to this, the company has encountered problems with shoe reservations and inefficiency in the time taken to attend to customers. For these reasons, the company was advised to adopt a relational based system. This team project is aimed at building and delivering an efficient and effective shoe store database management system that Bernd can use to maximize his profitability and deliver an efficient customer service.

Target Market

General Public

Given the occasion be it a wedding, party, sports, formal dinner, people can come and purchase these shoes from the store. The shoes are of good quality and majority of the shoes are budget friendly.

Sneakerheads

People who have shoe collections and sometimes trade them are called sneakerheads. They can make purchases from us to complete their collections and also trade with other people.

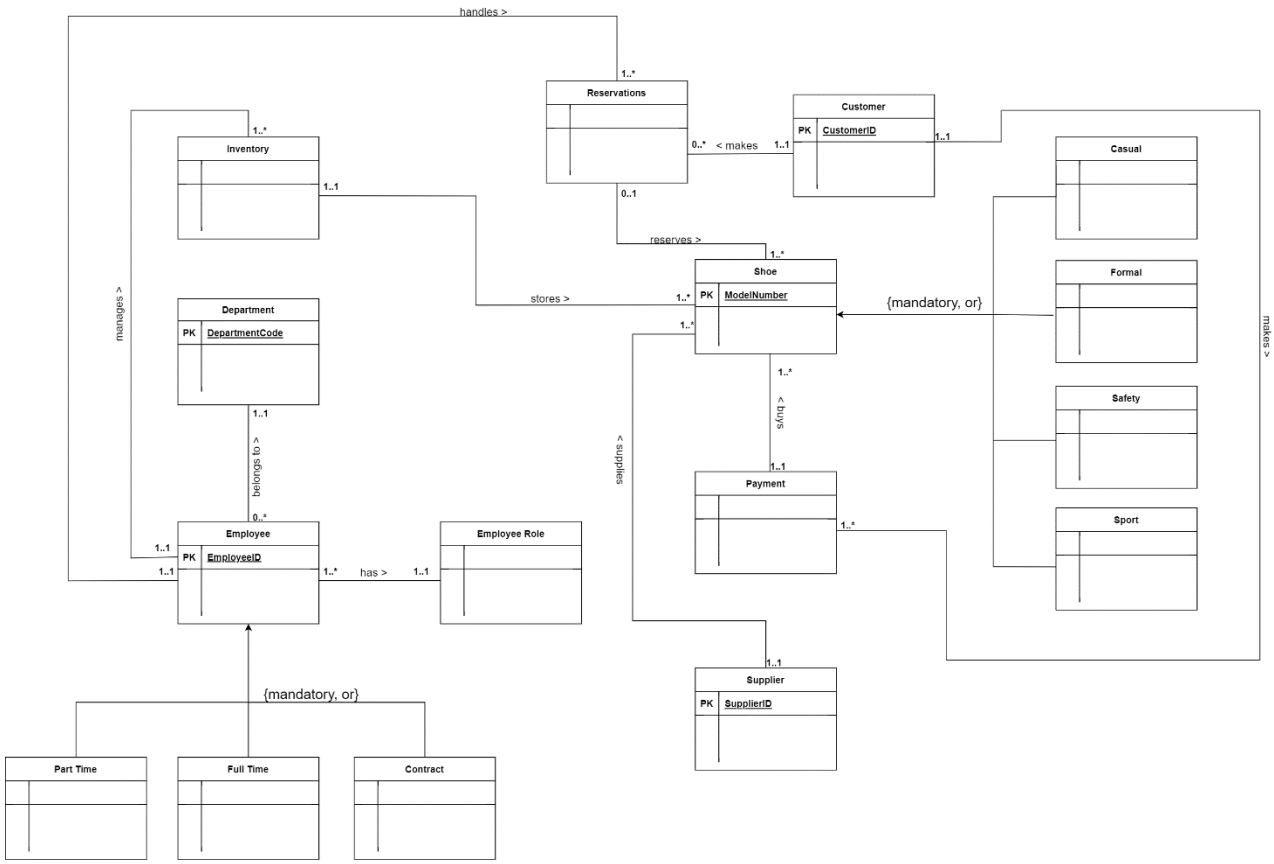
Functionalities

1. Track the shoes that are available.
2. Tracking the number of shoes in inventory according to storage categories.
3. Generate bill for purchases made by customer.
4. Get information on current shoe reservations.

5. Tracks the suppliers and the shoe brand they provide.
6. Getting part-time employees that are eligible for full time employment.

Task 1.2

Extend Entity Relationship Diagram



Strong Entities

1. Customer
2. Employee
3. Supplier
4. Shoe
5. Department

Weak Entities

1. Payment
2. Reservation

3. Employee Role
4. Part Time
5. Full Time
6. Contract
7. Casual
8. Formal
9. Safety
10. Sport
11. Inventory

Entities and Non-key Attributes

1. Customer: first_name, last_name, gender, telephone, address, email
2. Employee: first_name, last_name, gender, telephone, address, email, daily_working_hours
3. Supplier: company_name, address, telephone
4. Shoe: brand_name, colour, size, price
5. Department: department_name, location, email
6. Payment: payment_method, payment_date
7. Reservation: reservation_date, reservation_time
8. Employee Role: title, description
9. Part Time: number_of_working_days, hourly_rate
10. Full Time: salary, bonus
11. Contract: start_date, end_date, contract_fee
12. Casual: fashion_level, open_toed
13. Formal: formal_style, formal_event_use
14. Safety: protection_level, electric_hazard_rating
15. Sport: sport_type, outsole_type

16. Inventory: date_stored, storage_conditions

Assumptions

- All users are logged in.
- The store cannot run out of shoes.
- The store must have at least one department.
- Every person has a unique id.
- A customer cannot pay in instalments.
- Shoe sizes are UK standard
- A reservation is valid for a few days
- If a shoe is not available, it's either reserved or not in the store

Enterprise Rules

- A customer makes zero, one or many reservations
- A reservation belongs to exactly one customer

- A customer makes one or more payments
- A payment belongs to exactly one customer

- A reservation reserves one or more shoes
- A shoe is reserved by zero or one reservation

- An employee belongs to exactly one department

- A department can have zero or more employees

- An employee can have exactly one role
- A role can have many employees

- An employee manages one or more inventories
- An inventory is managed by exactly one employee

- An employee handles one or more reservations
- A reservation is handled by exactly one employee

- Payment buys one or more shoes
- A shoe is bought by exactly one payment

- A supplier supplies one or more shoes
- A shoe is supplied by exactly one supplier

- An inventory has one or more shoes
- A shoe belongs to exactly one inventory

Relationships

- Customer **makes** reservation
- Supplier **supplies** shoe
- Reservations **reserves** shoe
- Employee **has** a role

- Employee **belongs** to a department
- Employee **handles** reservations
- Payment **secures** shoe
- Inventory **stores** shoes

Generalisation / Specialisation

- A formal shoe is a shoe.
- A sport shoe is a shoe
- A casual shoe is a shoe
- A safety shoe is a shoe
- A full-time employee is an employee
- A part-time employee is an employee
- A contract employee is an employee

Task 2.1

Logical Database Design

Customer: **customer_id**, first_name, last_name, gender, telephone, address, email

Employee: **employee_id**, ***role_id***, ***department_code***, first_name, last_name, gender, telephone, address, email, daily_working_hours

Supplier: **supplier_id**, company_name, address, telephone, email

Shoe: **model_number**, ***supplier_id***, brand_name, colour, size, pricemaintenance_method

Department: **department_code**, department_name, location, email

Payment: **invoice_number**, ***customer_id***, payment_method, payment_date

Reservation: **reservation_id**, ***employee_id***, ***customer_id***, ***model_number***, reservation_date, collection_time

Employee Role: **role_id**, title, role_description

Part Time: ***employee_id***, number_of_working_days, hourly_rate

Full Time: ***employee_id***, salary, bonus

Contract: ***employee_id***, start_date, end_date, contract_fee

Casual: ***model_number***, fashion_level, open_toed

Formal: ***model_number***, formal_style, formal_event_use

Safety: ***model_number***, protection_level, electric_hazard_rating

Sport: ***model_number***, sport_type, outsole_type

Inventory: **inventory_id**, ***model_number***, ***employee_id***, date_stored, storage_conditions