

Data and Applications: Project Phase 1

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1 Introduction

1.1 Purpose

The purpose of this document is to list the software requirements for a store chain management system.

1.2 Overall Description of Mini-World

This mini-world consists of a system of stores and their respective employees, sharing customers across their network. It has an inventory entity which holds a set of the items available across the chain of stores. It also consists of a system to calculate the individual and overall profits of the chain, and hence determine each employee's contribution and salary.

1.3 Target Users

1.3.1 Cashier

Cashiers may use the database to:

- Check availability of items
- Conduct sales
- Check ongoing sales
- Add customers to database
- Restock items
- Check their salary

1.3.2 Manager

Cashiers may use the database to:

- Check availability of items
- Conduct sales
- Check ongoing sales
- Add customers to database
- Restock items
- Check profits by cashiers under them
- Check their salary and supervisee's salary

1.3.3 Chain Head

Cashiers may use the database to:

- Check availability of items
- Check profits by cashiers and managers, and overall
- Check ongoing sales
- Check salaries of all employees
- Check growth of customer numbers

2 Database Requirements

2.1 Database Design

The database consists of entities which

2.2 Entities

2.2.1 Item

This is an entity consisting of all the information regarding a single item.

- Item ID (Primary Key)(alphanumeric)
- Name (string)
- Type of item: Multi valued, since item may fall into more than one category. (string)
- Item Cost Price (numeric)

- Item Sell Price (numeric)
- Profit per Item: Derived (Cost Price - Sell Price) (numeric)
- Item Location: Multi valued, since item may be available in more than one store (string)
- Item Number: Total Number of items across the chain. May be changed with sales and loading. (numeric)

2.2.2 Store

This is an entity consisting of all the information regarding a single store.

- Store ID (Primary Key) (alphanumeric)
- Location (string)
- Types of Items Carried: Multi valued, since one store may carry many types of items (string)
- Number of Registers (numeric)

2.2.3 HR

This is an entity encompassing all the information regarding the employees and customers.

- HR ID (Primary Key)(alphanumeric)
- Name (string)
- Email(alphanumeric+symbolic)
- Phone Number: Multi Valued, since a person may have more than one phone number. (numeric)

2.2.3.1 Customer This is a subclass (and hence a weak entity) encompassing all the information regarding the customers.

- Store Credit: Derived from Sale data (numeric)

2.2.3.2 Employee This is a subclass (and hence a weak entity) encompassing all the information regarding the employees.

- Type of employee: Manager or Cashier (string)
- **Salary**: Derived as 20 percent of all profits made by the employee (numeric)
- Store ID (alphanumeric)
- Manager ID (alphanumeric)

2.2.4 Register

This is a weak entity encompassing all the information regarding the employees.

- Store ID (alphanumeric)
- Number: Must be less than or equal to no of registers in given store, unique ID per store (numeric)
- Cashier IDs: Multi valued (alphanumeric)
- Manager ID (alphanumeric)
- Total Profit: Derived, as calculated monthly from the purchases (numeric)

2.2.5 Sales

This is a weak entity encompassing all the information regarding the sales.

- Sale ID: Unique ID per store, if no sale is going on, then ID is 0 (alphanumeric)
- Store ID (alphanumeric)
- Start Date (date)
- End Date (date)
- Percentage Store Credit: Percentage store credit given to customer per item. (numeric)

2.3 Relationship Types

2.3.1 Bought

Relationship between Customer and all Items bought up till now.

- Customer HR ID (alphanumeric)
- Item Name: Multi valued since customer may have bought more than 1 item (string)

2.3.2 Has

Relationship between Store and Items available in store.

- Store ID (alphanumeric)
- Item Name: Multi valued since store may have more than 1 item (string)

2.3.3 Supervises

Relationship between Managers and Cashiers managed by them.

- Manager HR ID (alphanumeric)
- Cashier HR ID: Multi valued since manager may have more than 1 cashier under them. (alphanumeric)

2.3.4 Purchases

Relationship between Items, Customer, Employee, Sale and Store.

- Customer HR ID (alphanumeric)
- Item ID: Multi valued since customer may have bought more than 1 item (alphanumeric)
- Employee HR ID (alphanumeric)
- Store ID (alphanumeric)
- Sale ID (alphanumeric)

3 Functional Requirements

3.1 Loading

For adding new objects of an entity type:

- New employee
- New customer
- New store
- New item
- Restock items

3.2 Modify

To change any existing entity's attributes:

- Customer Details
- Employee Details
- Item Details
- Store Details

3.3 Delete

To remove an object of an entity from the database:

- Remove Item
- Remove Customer
- Remove Employee
- Remove Store

3.4 Report

To calculate the total from the profit and sales attributes:

- Employee Profit and Sales
- Store Profit and Sales