Database Systems Development and Implementation Plan

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MSIT 5210-Databases

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# Entity-Relationship Model

## Subjects of Interest

Table 1: Products

ProductId (int)

ProductName (varchar)

ProductDescription (varchar)

ProductPrice (decimal)

ProductQuantity (int)

SupplierId(int)

Table 2: Customers

CustomerId (int)

CustomerName (varchar)

CustomerEmail (varchar)

CustomerPhone (varchar)

Table 3: Orders

OrderId (int)

CustomerId (int)

OrderDate (date)

TotalPrice (Decimal)

Tax(Decimal)

Table 4: Order\_Items

OrderId (int)

ProductId (int)

Quantity (int)

Price (decimal)

Tax(decimal)

Table 5: Employees

EmployeeId (int)

EmployeeName (varchar)

EmployeeEmail (varchar)

EmployeePhone (varchar)

EmployeePosition (varchar)

EmployeeSalary (decimal)

Table 6: Suppliers

SupplierId (int)

SupplierName (varchar)

SupplierEmail (varchar)

SupplierPhone (varchar)

SupplierAddress (varchar)

## Business Rules

Customers can place many orders.

Orders should have at least one order item.

Employees can work in multiple positions.

Multiple suppliers supply the products.

Products can have multiple order items.

Orders can be placed by only one customer.

## Entitles, attributes, relationships & cardinality constraints

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## Entity Relationship Diagram (ERD)

Diagram

Description automatically generated

Figure - Sample 3 Table ER Diagram (Crows Foot Notation)

## How does this design fulfill the mission and/or goals of your target organization? The design presented here fulfills the mission and goals of Walmart by providing an efficient and organized way to manage their business operations. The tables are designed in third normal form which helps ensure data integrity and minimizes data redundancy and inconsistencies.

To ensure that the data in our model is in at least 3rd Normal Form (3NF), we need to

eliminate any transitive dependencies. A transitive dependency occurs when a non-key

attribute is dependent on another non-key attribute, which is dependent on the primary key.

In our design, we have eliminated any transitive dependencies by separating the

attributes into different tables. (Kelly, 2018) Each table has a primary key, and the non-key

attributes are dependent only on the primary key.

For example, in the Products table, product\_id is the primary key, and the

product\_name, product\_description, product\_price, and product\_quantity,supplier\_ID are

dependent only on the product\_id. This eliminates any transitive dependencies and ensures

that the Products table is in 3NF.

Similarly, the Customers, Orders, Order\_Items, Employees, and Suppliers tables are

all in 3NF, with primary keys and non-key attributes dependent only on the primary key.

The Products table contains details about the products that Walmart sells, such as

product name, description, price, quantity, and the supplier that provides the product. The

relationship between the Products and Suppliers tables is many-to-one, as many suppliers

can provide one product which allows Walmart to keep track of which supplier provides

each product and manage their relationships with different suppliers.

The Customers table contains information about Walmart's customers like name,

email, phone number, address, and city. The relationship between the Customers and Orders

tables is one-to-many, as one customer can place many orders which allows Walmart to keep

track of customer orders and provide personalized service. (Lucy, 2020)

The Orders table contains information about each order placed by a customer, such as

order date and total price. The relationship between the Orders and Order\_Items tables is

one-to-many, as one order can contain many order items. The Order\_Items table contains

details about each item in an order, such as product, quantity, and price.

The Employees table contains information about Walmart's employees like name,

email, phone number, position, and salary. This table allows Walmart for keeping track of

employee information and manage their workforce efficiently. (Lucy, 2020)

Additionally, Walmart can use this design to manage employee information, such as

salaries, positions, and performance. This can help Walmart improve employee retention and

job satisfaction, leading to better customer service and increased sales.

Overall, this design fulfills the mission and goals of Walmart by providing an efficient

and organized way to manage their business operations, enabling them to provide quality

products and services to their customers.

References

*Third normal form (3NF)* *Studytonight.com*. Available at: https://www.studytonight.com/dbms/third-normal-form.php (Accessed: April 28, 2023).

*How big data analysis helped increase Walmart's sales turnover?* *ProjectPro*. Available at: https://www.projectpro.io/article/how-big-data-analysis-helped-increase-walmarts-sales-turnover/109 (Accessed: April 28, 2023).