Online Retail Database

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OBJECTIVE OF THE PROJECT

• Designing a systematic online retail store database.

• Easily maintainable and scalable.

• Assigning a dynamic 'preference index' to all the sellers

• Secure payment gateway leading to maximum customer satisfaction

INTRODUCTION

We are designing a systematic, maintainable and scalable database service leveraging the full power of SQL relational database. We also aim to integrate a fast and secure payment gateway. A customer can register to purchase an item. The customer will provide bank account number and bank name (can have multiple account number). After registration, each customer will have a unique customerid, userid and password. A customer can purchase one or more item in different quantities. The items can of different classes based on their prices. Based on the quantity, the price of the item and discount (if any) on the purchased items, the bill will be generated. A bank account is required to settle the bill. The items can be ordered to one or more suppliers.

FUNCTIONALITY

The following points briefly explain the functionality of the database model:

• Every customer has a unique userID and a secure password. A customer can have multiple related accounts defined in the customer_accounts table

• Every item will have multiple suppliers, categorized into various classes

• Every customer's order will be defined in the customer_order table. Moreover all the items in one particular order will be stored in the order_items table

•We use a mathematical parameter called preference index to define the priority order for suppliers of a particular product

DETAILS

Classes Involved

• Customer: customer_id, user_id, password

• Customer Accounts: account_id, bank_account_no, bank_name, customer_id

• Customer Order: customer_order_id, total_price, customer_account_id

• Item: item_id, item_name

• Class: class_id, item_id, price, class_type

• Order Item: order_item_id, customer_order_id, item_id, quantity, price, supplier_id, class_id

• Supplier Item: supplier_item_id, supplier_id, class_id, discount, stock, commission

MATHEMATICAL SECTION:

Preference Index is our innovative mathematical equation to define the priority order for suppliers of a particular product .We are taking the insight of sigmoid function to formulate our own function

SIGMOID FUNCTION:

A **sigmoid function** is a mathematical function having a characteristic "S"-shaped curve or **sigmoid curve**. Often, *sigmoid function* refers to the special case of the logistic function shown in the first figure and defined by the formula:

$$\frac{1}{1+e^{-x}}$$

$$1$$

$$0.5$$

$$0$$

$$-6 \quad -4 \quad -2 \quad 0 \quad 2 \quad 4 \quad 6$$
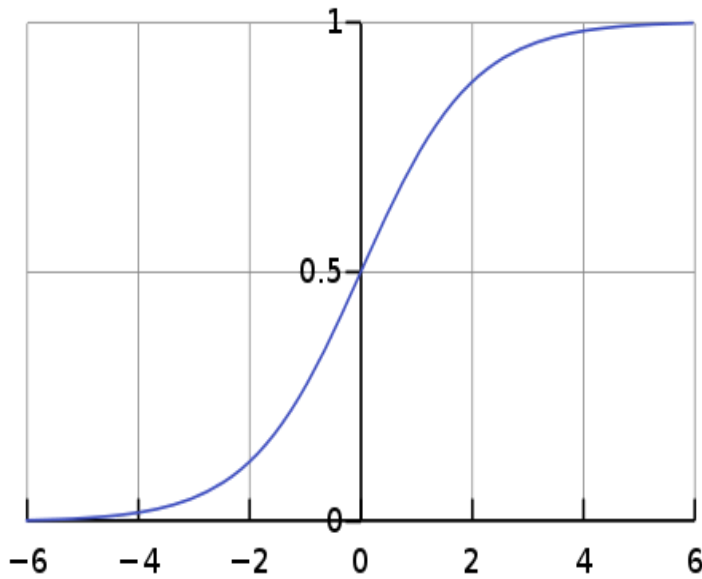
PREFERENTIAL INDEX:

$$\text{P.I.} = \frac{1}{1+e^{-ax-by+cz}}$$

Here,

x is the percentage commission,

y is the seller review in the scale of 10

z is the discount on an item

a, b, c are constants used to take the weighted and normalized sum of the above parameters

Conclusion

We were successfully able to design an ER Model for the given problem statement. From there, we transformed it to a Relational Database Model. We also firmly believe that the usage of preference index will significantly improve the user experience and also help to increase our revenue. Higher preference index signifies that the seller has a good reputation and trust among the customers.