**Multi-vendor E-commerce Database System**

1. Group information

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1. ER diagram design

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| Fig.1 ER diagram |

This project aims to create and execute a multi-vendor e-commerce platform with a focus on personalizing the user experience. In ER diagram, we have product, customer, order, offer, vendor five entities. There are some constraints on Relationship Sets.

The relationship between customer and product: **many-to-many constraint**. A customer can buy one or more products, while a product can be purchased by any customer.

The relationship between vendor and product: **one-to-many constraint.** A vendor can provide one or more products, while a product should be provided by a vendor.

Moreover, the username, password and salt are prepared for log in page. Though inventory should be modified by the vendor, it’s placed in product entity for display in purchase module.

1. Relational table design

Design the relational table according to the requirements. All relational tables are shown below. Some specific explanations are in remark.

In the database system, we have designed 5 relational tables. The offer table is implemented by vid foreign key in product table. We need a vendor admin table

to store vendor administrator.

Tab.1 Customer table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **attributes** | **data type** | **length** | **Constraint type** | **null or not** | **attributes instructions** | **remark** |
| cid | integer |  | primary key | not null | customer id | auto-increment |
| contactNumber | integer | 8 |  | not null | customer’s contact number | Multiple phone numbers are allowed |
| shippingDetail | char | 20 |  | not null | Order delivery status |  |
| username | varchar | 50 |  | not null | name of the customer log in | Allow modification |
| password | char | 255 |  | not null | password of the customer log in | Allow modification |
| salt | integer |  |  | not null | For hash password | random number |

Tab.2 Vendor table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **attributes** | **data type** | **length** | **Constraint type** | **null or not** | **attributes instructions** | **remark** |
| vid | integer |  | primary key | not null | vendor id | auto-increment |
| vname | char | 20 |  | not null | name of the vendor log in | Allow modification |
| password | char | 255 |  | not null | password of the vendor log in | Allow modification |
| score | integer |  |  |  | a vendor rating | allow null |
| geographic | char | 20 |  | not null | vendor location |  |
| salt | integer |  |  | not null | For hash password | random number |

Tab.3 product table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **attributes** | **data type** | **length** | **Constraint type** | **null or not** | **attributes instructions** | **remark** |
| pid | integer |  | primary key | not null | product id | auto-increment |
| pname | char | 20 |  | not null | product name | Allow modification |
| price | real |  |  | not null | the price of product | Allow modification |
| vid | integer |  | foreign key | not null | vendor id |  |
| inventory | integer |  |  | not null | Inventory of product |  |
| tag\_1 | char | 20 |  | not null | product tag, provided by vendor |  |
| tag\_2 | char | 20 |  | not null | product tag, provided by vendor |  |
| tag\_3 | char | 20 |  | not null | product tag, provided by vendor |  |

Tab.4 order table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **attributes** | **data type** | **length** | **Constraint type** | **null or not** | **attributes instructions** | **remark** |
| oid | integer |  | composed primary key | not null | order id | auto-increment |
| cid | integer |  | composed primary key | not null |  | foreign key |
| pid | integer |  | composed primary key | not null |  | foreign key |
| quantity | integer |  |  | not null | the quantity of each product |  |
| orderStatus | ENUM |  |  | not null | 'order received', 'shipping', 'fulfilled', 'cancelled' |  |
| orderTime | Timestamp |  |  |  |  |  |

Tab.5 vendor admin table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **attributes** | **data type** | **length** | **Constraint type** | **null or not** | **attributes instructions** | **remark** |
| id | integer |  | primary key | not null | vendor administrator id | auto-increment |
| username | varchar | 50 |  | not null | name of the vendor administrator log in | Allow modification |
| password | char | 255 |  | not null | password of the vendor administrator log in | Allow modification |
| salt | integer |  |  | not null | For hash password | random number |

1. Coding instruction
   1. Readme description
   2. tbc
2. Summary

Database systems will play a key role in storing and managing the complex relationships between suppliers, products, customers, and transactions.

Through the effective design and implementation of the database system, the smooth operation of the platform can be ensured to provide users with a personalized and efficient shopping experience.