ISOM 3260
Database Design and Administration

Spring 2018

Team Project Report

TasteCHA | (Group Number: 305)

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1. Introduction

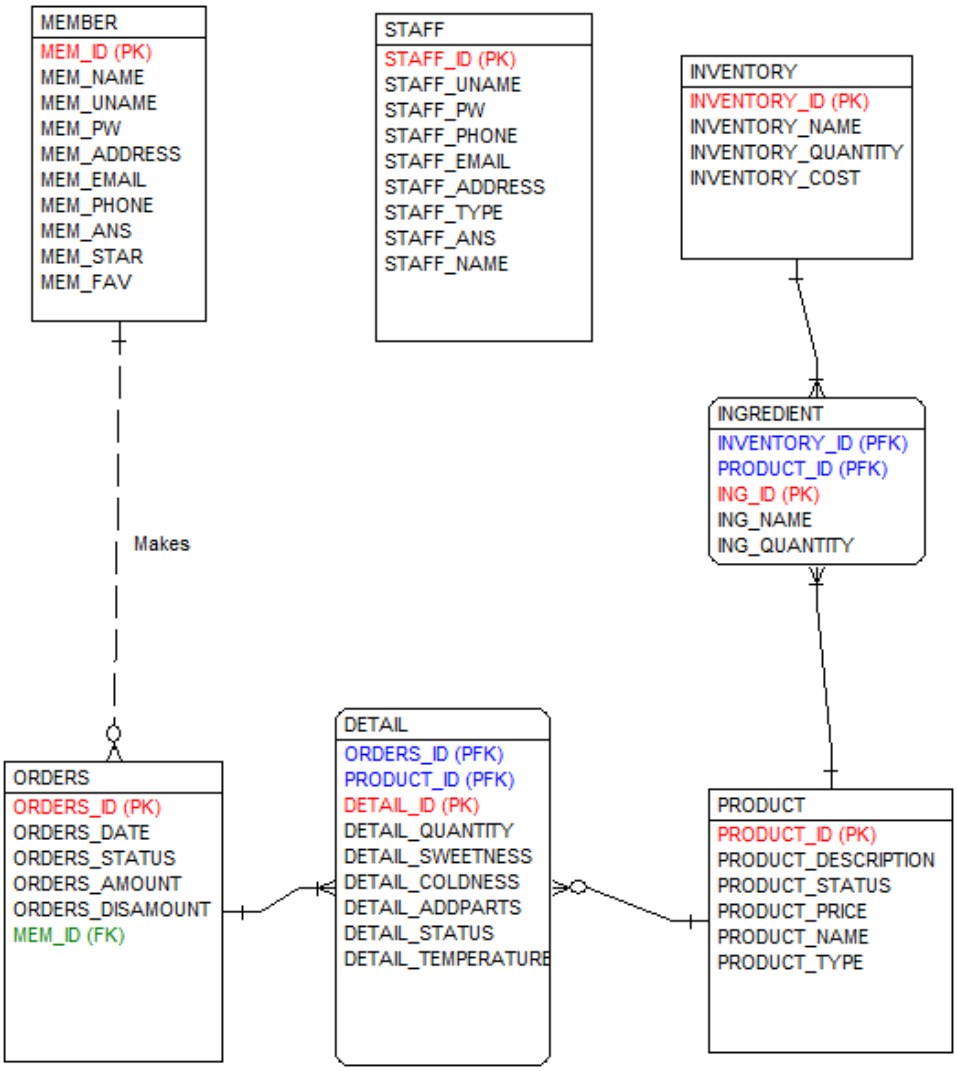
Our team of six IT consultants and developers have developed a Point of Sales (POS) system for the company, TasteCHA, which sells beverages.

After gathering and understanding their requirements, we have developed a conceptual data model to understand various entities, attributes and their relationships. A logical data model is drawn to transform the entity relationship diagram (ERD) into relations. A data dictionary is further illustrated to design databases stored in Oracle SQL Server. Below you may find the details of the components mentioned above.

Currently, our product is an POS system, which allows staff to make orders and customers to browse and buy products right away in the self-service kiosk. Staff members will also have control the production process and overlook the operational efficiency of the company.

2. Conceptual data model

E-R Diagram



As POS system, Group 5 TasteCHA on two important groups for its continued success: customers and staffs.

Members have MEM_ID, MEM_NAME, MEM_UNAME, MEM_PW, MEM_ADDRESS, MEM_EMAIL, MEM_PHONE, MEM_ANS (answer for safety question), MEM_STAR and MEM_FAV

Member can make as many orders as possible. Members can also make no orders at all. Orders have ORDER_ID, ORDER_DATE, ORDER_TIME and ORDER_STATUS, ORD_DISAMOUNT and MEM_ID as of storing corresponding member who makes the order. Each order belongs to one and only one customer. Each order can contain many products, but there must be at least one

product in each order. Some drinks may be unpopular among customer and thus are not added in any DETAIL or ORDERS at all.

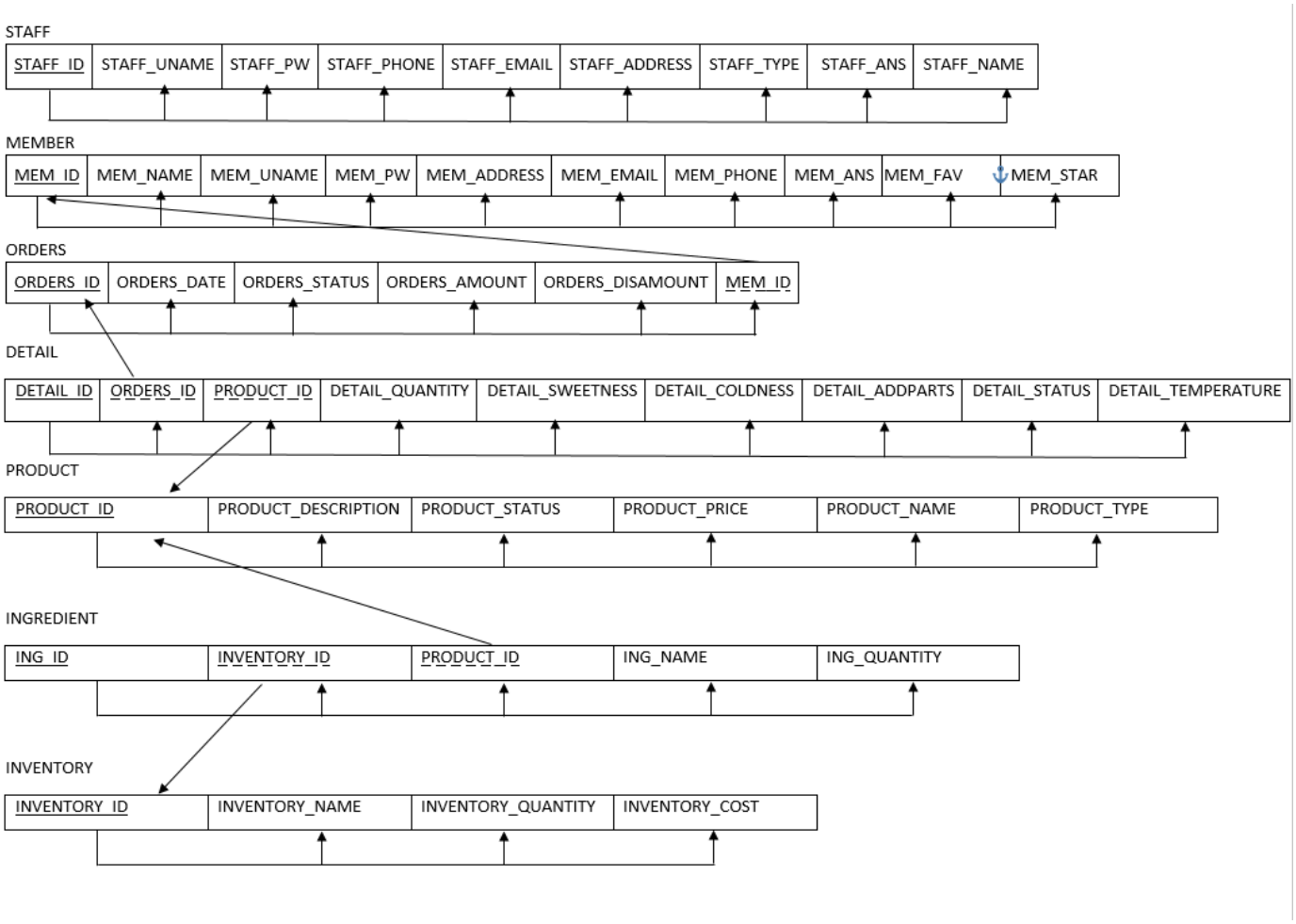
Each Order has at least one DETAIL, which stores the information of drink that ordered by member. Each Detail belongs to one and only one orders. DETAIL has the following attribute: DETAIL_ID, DETAIL_QUANTITY, DETAIL_SWEETNESS, DETAIL_TEMPERATURE, DETAIL_COLDNESS, DETAIL_ADDPARTS, DETAIL_STATUS. EACH DETAIL belongs to one product. And, one product can belong to zero to many detail. As its many-to-many relationship between ORDERS and PRODUCT, we assign it as an associative entity

Product have PRODUCT_ID, PRODUCT_DESCRIPTION, PRODUCT_STATUS, PRODUCT_PRICE, PRODUCT_NAME and PRODUCT_TYPE.

INGREDIENT is stored as a associative entity to indicate each ingredients in each product, with ING_ID, ING_NAME, ING_QUANTITY, INVENTORY_ID (PFK), PRODUCT_ID(PFK). INVENTORY have the attributes of INVENTORY_ID, INVENTORY_NAME,INVENTORY_QUANTITY and INVENTORY_COST. INGREDIENT could belong to one inventory and inventory could belong to many ingredients.

Other than MEMBER, we only store staff record IN STAFF entity, including STAFF_ID, STAFF_UNAME, STAFF_NAME, STAFF_PW, STAFF_PHONE, STAFF_ADDRESS, STAFF_EMAIL,STAFF_TYPE, STAFF_ANS.

3. Logical data model



4. Data dictionary

Entity: DETAIL						
Attributes	Datatype	PK	FK	Length	NULL	Description
ORDERS_ID	NUMBER		✓(PFK)	20,0	FALSE	Unique identifies order
PRODUCT_ID	NUMBER		✓(PFK)	20,0	FALSE	Unique identifies product
DETAIL_ID	NUMBER	✓		20,0	FALSE	Unique identifies detail
DETAIL_QUANTITY	NUMBER			20,0	FALSE	Number of drink per detail
DETAIL_SWEETNESS	VARCHAR2			20	TRUE	Sweetness of a drink
DETAIL_COLDNESS	VARCHAR2			20	TRUE	Coldness of a drink
DETAIL_ADDPARTS	VARCHAR2			20	TRUE	Extra topping of drink in a detail
DETAIL_STATUS	VARCHAR2			30	FALSE	Production stage of drink in a detail
DETAIL_TEMPERATURE	VARCHAR2			20	TRUE	Temperature of drink in a detail

Entity: INGREDIENT						
Attributes	Datatype	PK	FK	Length	NULL	Description
INVENTORY_ID	NUMBER		(PFK)✓	20	FALSE	Uniquely identifies inventory
PRODUCT_ID	NUMBER		(PFK)✓	20	FALSE	Uniquely identifies product
ING_ID	NUMBER	✓		20	FALSE	Uniquely identifies ingredient
ING_NAME	VARCHAR2			30	FALSE	Quantity of a ingredient
ING_QUANTITY	VARCHAR2			10	FALSE	Quantity of a ingredient needed for preparing a drink

Entity: INVENTORY						
Attributes	Datatype	PK	FK	Length	NULL	Description
INVENTORY_ID	NUMBER	✓		20	FALSE	Uniquely identifies inventory
INVENTORY_NAME	VARCHAR2			30	FALSE	Name of inventory
INVENTORY_QUANTITY	NUMBER			20	FALSE	Quantity of inventory
INVENTORY_COST	NUMBER			20,2	TRUE	Unit cost of a inventory
INVENTORY_STATUS	VARCHAR2			20	TRUE	Availability of inventory

Entity: MEMBER						
Attributes	Datatype	PK	FK	Length	NULL	Description
MEM_ID	NUMBER	✓		20	FALSE	Uniquely identifies member
MEM_NAME	VARCHAR2			30	FALSE	Name of member
MEM_UNAME	VARCHAR2			20	FALSE	Username of member
MEM_PW	VARCHAR2			20	FALSE	Password
MEM_ADDRESS	VARCHAR2			100	TRUE	Mailing address of member
MEM_EMAIL	VARCHAR2			50	TRUE	Email of member
MEM_PHONE	VARCHAR2			20	FALSE	Phone number of member
MEM_ANS	VARCHAR2			50	FALSE	Answer of safety question when he forgets password
MEM_STAR	NUMBER			(20,2)	FALSE	The redemption point available for member
MEM_FAV	VARCHAR2			30	FALSE	The favourite drink type of member

Entity: ORDERS						
Attributes	Datatype	PK	FK	Length	NULL	Description
ORDERS_ID	Number	✓		20,0	FALSE	Uniquely identifies order
ORDERS_DATE	Date			20	FALSE	Date when the order is placed
ORDERS_STATUS	Varchar2			30	FALSE	Show whether the order is processing/completed
MEM_ID	Number		✓	20,0	FALSE	Uniquely identifies member. It shows which member places which order.
ORDERS_AMOUNT	Number			20,2	FALSE	The total money amount of an order
ORDERS_DISAMOUNT	Number			20,2	FALSE	The total money amount of an order the member should pay after redemption

Entity: PRODUCT						
Attributes	Datatype	PK	FK	Length	NULL	Description
PRODUCT_ID	Number	✓		20,0	FALSE	Uniquely identifies product
PRODUCT_DESCRIPTION	Varchar2			100	FALSE	Brief description of each product
PRODUCT_STATUS	Varchar2			20	FALSE	Show the availability of each product
PRODUCT_PRICE	Number			5,2	FALSE	Price of each product
PRODUCT_NAME	Varchar2			30	FALSE	Name of each product

PRODUCT_TYPE	Varchar2			20	FALSE	Category of the product belongs to

Entity: STAFF						
Attributes	Datatype	PK	FK	Length	NULL	Description
STAFF_ID	Number	✓		20		Uniquely identifies staff
STAFF_UNAME	VARCHAR2			50	FALSE	Username of staff
STAFF_PW	Number			38		Password of staff
STAFF_PHONE				30		Phone number of staff
STAFF_EMAIL	VARCHAR2			100		Email of staff
STAFF_ADDRESS	VARCHAR2			200		Mailing address of staff
STAFF_TYPE	VARCHAR2			20	FALSE	The job position of staff
STAFF_ANS	VARCHAR2			30	FALSE	Answer of safety question when he forgets password
STAFF_NAME	VARCHAR2			50	FALSE	Name of staff

5. Functional Requirements

Staff

a. Cashier

1. Allow staff to insert new product information
2. Allow staff to update product information
3. Allow staff to update order status for orders
4. Allow staff to place order for customer
5. Allow staff to conduct registration for members
6. Allow staff to retrieve the login password/reset the login password in case they have forgotten.
7. Allow staff to help customers to indicate their most favorite product type during the member registration (Bonus point: Set B)

b. Barista

1. Allow staff to update order status for order
2. Allow staff to view order list
3. Allow staff to retrieve the login password/reset the login password in case they have forgotten.

c. Manager

1. Allow manager to display "Manager Dashboard" (refer below for the manager dashboard requirement)
    - Show total amount of daily and monthly sales
    - Show all sales order of today (And be able to view detail of each sales order)
    - Show the 5 most popular products and each of the product sales (in terms of quantity)
    - Show the top 5 members and their individual sales amounts
    - Show sales of a particular product, in terms of quantity sold
    - Show the number of orders of different statuses
2. Allow manager to retrieve the login password/reset the login password in case they have forgotten.

Customer

1. Allow customers to search products and view product details
2. Allow customers to add products into shopping cart for later retrieval
3. Allow customers to view and edit the shopping cart
4. Allow customers to delete shopping cart lines
5. Allow customers to make purchase
6. Allow customers to customize their beverages
7. Allow members to earn stars at purchase time
8. Allow members to redeem rewards
9. Allow members to view best-selling product, that matched with the member's favorite type, within 3 months and is available. (Bonus point: Set B)

6. Conclusion

Currently, our product is still in the preliminary stage, which provides the basic functions of a purchase system. Customers can search, view and add products in a shopping cart. Also, they can

edit and customise the beverages in the shopping cart. Member can even earn stars at purchase time and redeem rewards. Member can also get recommended of a product they may be interested in.

Cashier can insert and update products and update order status. They can place order, conduct registration for member and retrieve/reset login password if they have forgotten. Barista can update order status for order, view order list and also retrieve/reset login password if they have forgotten. Managers can view manager dashboard for a summary of total daily and monthly sales, sales order of the day, five most popular products, five members with highest spending, sales of a particular product, number of orders of different statues.

Further developments are needed to improve on recommendation engines and user experience. In the long run, we should allow consumers to register by himself so as to increase more participants to join our customer loyalty program. Apart from personalized promotion, we may notify members if new products of members' favorite type is launched. It provides a more holistic experience to each customer.

7. Suggestions

REQUIREMENTS

1. Update Status Automatically: Order status can be updated automatically, rather than having manager manually doing it, so as to save time and resources.
2. Manager Dashboard Graphs: Graphs can be drawn to illustrate the reality of delivering a manager dashboard, because managers usually prefer to understand patterns and insights visually and at one glance.
3. Customer Loyalty Management: More push notifications and promotions can be introduced to persuade more purchases and portrait a more vivid workplace environment.

LOGISTICS

1. Update Software Used: Oracle Forms seems to be rather outdated. More advanced alternatives can be explored to prepare students more practically and beneficially.
2. Testing Skills: Some students may be confused about the proper procedures of testing. More guidelines can be given to equip students with more advanced testing skills, for example, what aspects they should focus on and how to prioritise and handle testing amendments.

USER INTERFACE

1. Web Design: More practices on web design can be done, for example, how to use CSS and HTML. This is to equip students with more technical skills.
2. Mobile Compatibility: Mobile app design can also be encouraged, so as to fit the app in different operating systems and screens.

8. Assumptions

CUSTOMERS

1. Customers understand what this website is about and for before registration.
2. Customers do not need to have an online feedback system and will contact our staff whenever necessary.

MEMBERS

1. Password should be not less than 5 or more than 20 number/character/symbols, including uppercase and lowercase
2. Members can reset the original password
3. Members could remember their phone number for point redemption.
4. The phone number of each member is unique.
5. If the member does not specify his or her favorite type, our system will suggest the most popular product to him.

STAFF

1. Staff members have their accounts directly created in database and do not need an additional interface for registration.
2. Staff members understand what this website is about and for before administration.
3. FRM-40100(FRM-40100: At first record): No action could be taken for this message which would exist when we scroll down the scroll and then scroll up to the first row.
4. Timer: we set the timer for refresh the data block' VIEW_DETAIL' every 5 seconds. (Related data block:'VIEW_DETAIL' and ' VIEW_DET_CASHIER)
5. Staff can reset the original password

PARTNERSHIPS

1. Suppliers have already formed partnerships with us and can supply liquor products to us.
2. Credit card companies have formed partnerships with us and can handle our transaction payments reliably.
3. All inventories are always available.

ORDER

1. Order cannot be cancelled after transaction completed.
2. Each person can only order 10 cups in each detail of a purchase.
3. Availability of products will be checked again before payment. If product is stock out, order must be cancelled before execute checkout

PRODUCT

1. The price of each product is less than $100, which means the maximum price is $99.9.