GROUP - 9
DAMG6210.18472.202210
Project Submission 2
Database Management and Database Design

PROJECT TOPIC: **OXYGEN RENTAL SYSTEM**

PROJECT MEMBERS:

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PROBLEM STATEMENT:

As 2nd wave of covid-19 is ravaging the lives of people in USA, the occurrence of clinical oxygen shortage acted as catalyst to the deaths across Florida, Texas and other populated states. The purpose of the database is to store, maintain and process data amidst the pandemic. The main aim is to provide a platform where people can connect to the nearest oxygen suppliers for oxygen cylinders in emergency.

OBJECTIVES:

- Identify and connect the nearest oxygen supplier based on the customer's location and availability.
- Maintain records of near real-time oxygen availability status across multiple oxygen industry plants.
- Maintain (Insert, Update, delete) data of Oxygen plant locations and Customers.
- Maintain the Booking History (Unique transaction ID, Customer ID, plant ID, quantity) to visualise and generate a report on demand of oxygen across county.
- Security: Providing them a login-logout option based on Authorization role for security purposes.
    - o Below are the possible authorization roles:
        1. Customer role/User
        2. Oxygen supplier role
        3. Admin
- Referential integrity: When the customer places an order, his unique-ID, oxygen plant Id are stored as foreign keys in a single table called Order. In addition, foreign keys will be used wherever needed to maintain the integrity of the data.

- Data Redundancy: To reduce the data redundancy across customer table and oxygen plant table which has many to many relationships, a third table called order with order-id will be created to avoid the redundancy of the data.
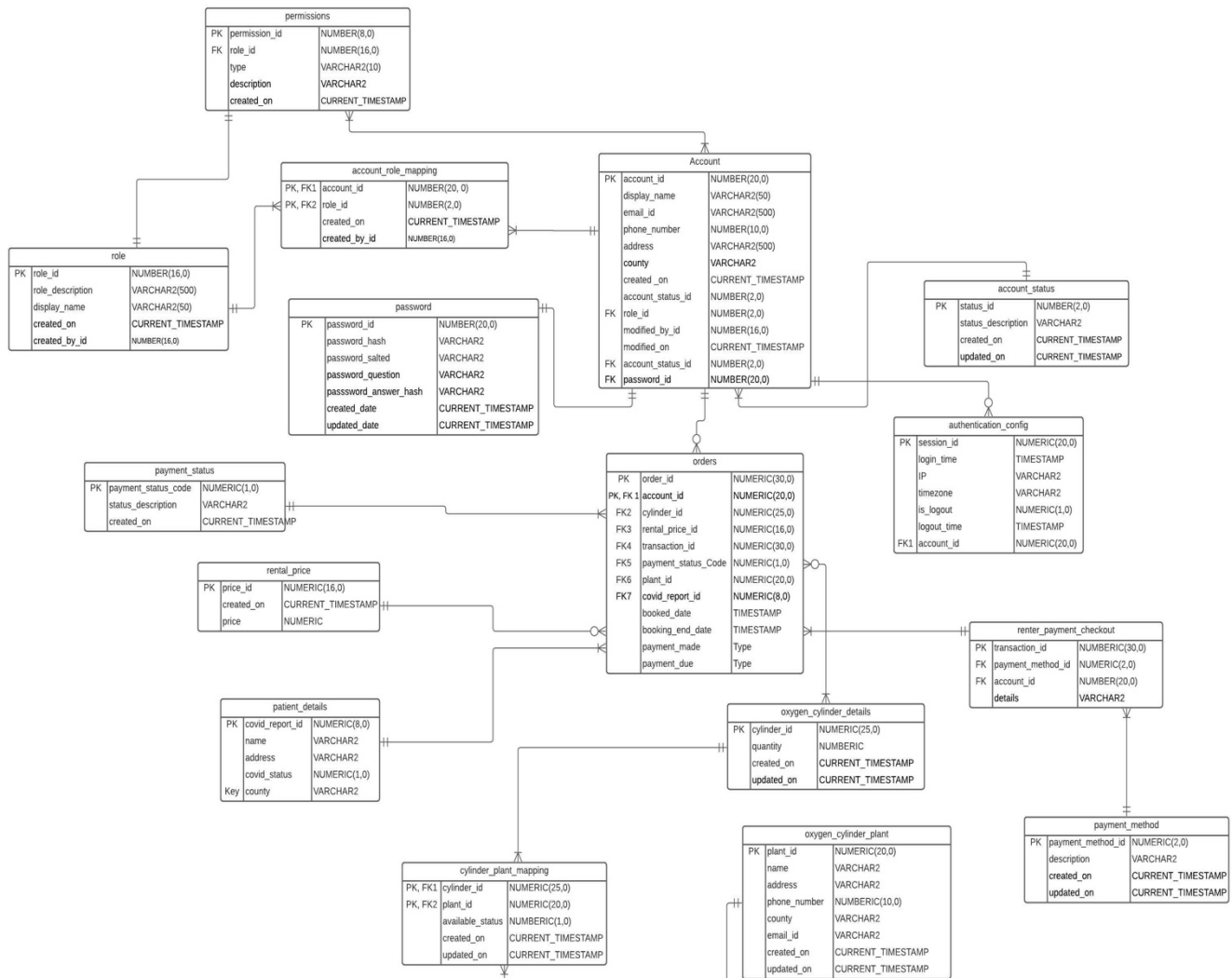
PROBLEM SOLUTION:

The Covid-19 has taken a striking toll on people all over the world, affecting health physically and mentally. Short of breath being one of the major symptoms impacting the lungs causing acute respiratory distress and failure. Due to this, demand for Oxygen has increased a great deal and difficulty to access an oxygen cylinder escalated. The Oxygen rental system project is to connect customers (patients) to suppliers based on location to make access to Oxygen easier.

DATABASE DESIGN DOCUMENT

The main purpose of the design document is to list out the requirements of Oxygen rental System project. It helps us to gather and analyse the ideas gathered. The document is subject to change, if the requirement add up to the project. Currently it is mainly prepared to set foundation for the design phase. This document prepared is the first version of objectives document and helps us convert the logical/ conceptual model to physical model (tables) for the project.

Design Requirement

- Specify the primary key in each table by specifying PK beside the attribute(s) fields.
- Specify the foreign key in each table by specifying FK beside the attribute(s) fields.
- Draw a line between the fields of each table to represent relationships between the tables and entities. The line drawn must be pointed directly to the fields in each table that determine the relationship.
- Apply Crow's Foot Notation
    - Entities are represented as boxes, and relationships are represented as lines between them.
    - The symbols used define the cardinality of the relation. Symbols used are ring (zero), dash (one), crow's foot (many).
- Specify which table is comes on which side of the relationship. (if one, place a dash, if many side place a crow's feet symbol next to the field where. The line ends)

ENTITY RELATIONSHIP DIAGRAM (ER-diagram)

permissions

PK	permission_id	NUMBER(8,0)
FK	role_id	NUMBER(16,0)
	type	VARCHAR2(10)
	description	VARCHAR2
	created_on	CURRENT_TIMESTAMP

account_role_mapping

PK, FK1	account_id	NUMBER(20, 0)
PK, FK2	role_id	NUMBER(2,0)
	created_on	CURRENT_TIMESTAMP
	created_by_id	NUMBER(16,0)

Account

PK	account_id	NUMBER(20,0)
	display_name	VARCHAR2(50)
	email_id	VARCHAR2(500)
	phone_number	NUMBER(10,0)
	address	VARCHAR2(500)
	county	VARCHAR2
	created_on	CURRENT_TIMESTAMP
	account_status_id	NUMBER(2,0)
FK	role_id	NUMBER(2,0)
	modified_by_id	NUMBER(16,0)
	modified_on	CURRENT_TIMESTAMP
FK	account_status_id	NUMBER(2,0)
FK	password_id	NUMBER(20,0)

role

PK	role_id	NUMBER(16,0)
	role_description	VARCHAR2(500)
	display_name	VARCHAR2(50)
	created_on	CURRENT_TIMESTAMP
	created_by_id	NUMBER(16,0)

password

PK	password_id	NUMBER(20,0)
	password_hash	VARCHAR2
	password_salted	VARCHAR2
	password_question	VARCHAR2
	passsword_answer_hash	VARCHAR2
	created_date	CURRENT_TIMESTAMP
	updated_date	CURRENT_TIMESTAMP

account_status

PK	status_id	NUMBER(2,0)
	status_description	VARCHAR2
	created_on	CURRENT_TIMESTAMP
	updated_on	CURRENT_TIMESTAMP

authentication_config

PK	session_id	NUMERIC(20,0)
	login_time	TIMESTAMP
	IP	VARCHAR2
	timezone	VARCHAR2
	is_logout	NUMERIC(1,0)
	logout_time	TIMESTAMP
FK1	account_id	NUMERIC(20,0)

payment_status

PK	payment_status_code	NUMERIC(1,0)
	status_description	VARCHAR2
	created_on	CURRENT_TIMESTAMP

orders

PK	order_id	NUMERIC(30,0)
PK, FK 1	account_id	NUMERIC(20,0)
FK2	cylinder_id	NUMERIC(25,0)
FK3	rental_price_id	NUMERIC(16,0)
FK4	transaction_id	NUMERIC(30,0)
FK5	payment_status_Code	NUMERIC(1,0)
FK6	plant_id	NUMERIC(20,0)
FK7	covid_report_id	NUMERIC(8,0)
	booked_date	TIMESTAMP
	booking_end_date	TIMESTAMP
	payment_made	Type
	payment_due	Type

rental_price

PK	price_id	NUMERIC(16,0)
	created_on	CURRENT_TIMESTAMP
	price	NUMERIC

renter_payment_checkout

PK	transaction_id	NUMBERIC(30,0)
FK	payment_method_id	NUMERIC(2,0)
FK	account_id	NUMBER(20,0)
	details	VARCHAR2

patient_details

PK	covid_report_id	NUMERIC(8,0)
	name	VARCHAR2
	address	VARCHAR2
	covid_status	NUMERIC(1,0)
Key	county	VARCHAR2

oxygen_cylinder_details

PK	cylinder_id	NUMERIC(25,0)
	quantity	NUMBERIC
	created_on	CURRENT_TIMESTAMP
	updated_on	CURRENT_TIMESTAMP

payment_method

PK	payment_method_id	NUMERIC(2,0)
	description	VARCHAR2
	created_on	CURRENT_TIMESTAMP
	updated_on	CURRENT_TIMESTAMP

oxygen_cylinder_plant

PK	plant_id	NUMERIC(20,0)
	name	VARCHAR2
	address	VARCHAR2
	phone_number	NUMBERIC(10,0)
	county	VARCHAR2
	email_id	VARCHAR2
	created_on	CURRENT_TIMESTAMP
	updated_on	CURRENT_TIMESTAMP

cylinder_plant_mapping

PK, FK1	cylinder_id	NUMERIC(25,0)
PK, FK2	plant_id	NUMERIC(20,0)
	available_status	NUMBERIC(1,0)
	created_on	CURRENT_TIMESTAMP
	updated_on	CURRENT_TIMESTAMP

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DOCUMENT ENTITY AND ATTRIBUTES WITH DATA TYPES

Account

Attribute	Datatype	Comments	Description
account_id	NUMBER(20,0)	Primary Key	Unique ID for the account
display_name	VARCHAR2(50)	Unique, Not Null	Name displayed for the account
email_id	VARCHAR2(500)	Not Null	Email Id of the user
phone_number	NUMBER(10,0)	Not Null	Contact number of the user
address	VARCHAR2(500)	Not Null	Address of the user
created_on	CURRENT_TIMESTAMP	Not Null	Date when account was created
account_status_id	NUMBER(2,0)	Foreign Key	Status ID of account
role_id	NUMBER(2,0)	Foreign Key	Role ID of account
modified_by_id	NUMBER(16,0)	Not Null	Modified by what id
modified_on	CURRENT_TIMESTAMP	Not Null	Time when something was modified
password_id	NUMBER(20,0)	Foreign Key	Password ID of the user
county	VARCHAR2(500)	Not Null	County of the user

Account_Status

Attribute	Datatype	Comments	Description
account_status_id	NUMBER(2,0)	Primary Key	Unique ID for status of an account
status_description	VARCHAR2	Not Null	Description of the account status
updated_on	CURRENT_TIMESTAMP	Not Null	Time when account was updated
created_on	CCURRENT_TIMESTAMP	Not Null	Time when account was created

Orders

Attribute	Datatype	Comments	Description
order_id	NUMERIC(30,0)	Primary Key	Unique Order ID of purchase
account_id	NUMERIC(20,0)	Foreign Key	Unique Account ID of user
cylinder_id	NUMERIC(25,0)	Foreign Key	Unique Cylinder ID of order
rental_price_id	NUMERIC(16,0)	Foreign Key	Price ID of the rental
transaction_id	NUMERIC(30,0)	Foreign Key	Transaction id of order
payment_status_code	NUMERIC(1,0)	Foreign Key	Payment status of the order
plant_id	NUMERIC(20,0)	Foreign Key	Unique Plant ID of the cylinder
covid_report_id	NUMERIC(8,0)	Foreign Key	Covid report id of the patient
booked_date	TIMESTAMP	Not Null	Booking date of the order
booked_end_date	TIMESTAMP	Not Null	Booking end date on the order
payment_made	TYPE	Not Null	Time when payment was made
payment_due	TYPE	Not Null	Time by when payment must be made

Permissions

Attribute	Datatype	Comments	Description
permission_id	NUMBER(8,0)	Primary Key	Permission ID of the account
account_id	NUMBER(20,0)	Foreign Key	Account id of the user
type	VARCHAR2(10)	Not Null	Type of permissions
description	VARCHAR2	Not Null	Description of permissions
created_on	CURRENT_TIMESTAMP	Not Null	Time when account is created

Oxygen_Cylinder_Details

Attribute	Datatype	Comments	Description
cylinder_id	NUMERIC(25,0)	Primary Key	Unique ID of the cylinder
quantity	NUMERIC	Not Null	Quantity of order
created_on	CURRENT_TIMESTAMP	Not Null	Time when details are created
updated_on	CCURRENT_TIMESTAMP	Not Null	Time when details are updated

Oxygen_Cylinder_Plant

Attribute	Datatype	Comments	Description
plant_id	NUMERIC(20,0)	Primary Key	Unique ID of the cylinder plant
name	VARCHAR2	Not Null	Name of the plant
address	VARCHAR2	Not Null	Address of the plant
phone_number	NUMERIC(10,0)	Not Null	Contact number of the plant
County	VARCHAR2	Not Null	County where plant is located
email_id	VARCHAR2	Not Null	Email id of the plant
created_on	TIMESTAMP	Not Null	Time when created
updated_on	TIMESTAMP	Not Null	Time when updated

Cylinder_Plant_Mapping

Attribute	Datatype	Comments	Description
cylinder_id	NUMERIC(25,0)	Foreign Key	Unique ID of the cylinder
plant_id	NUMERIC(20,0)	Foreign Key	Unique ID of the cylinder plant
available_status	NUMERIC(1,0)	Not Null	Availability Status of cylinder
created_on	CURRENT_TIMESTAMP	Not Null	Time when created
updated_on	CURRENT_TIMESTAMP	Not Null	Time when updated

Renter_Payment_Checkout

Attribute	Datatype	Comments	Description
transaction_id	NUMERIC(30,0)	Primary Key	Unique ID of the transaction
payment_method_id	NUMERIC(2,0)	Foreign Key	Payment ID of order
account_id	NUMBER(20,0)	Foreign Key	Unique ID of the account
details	VARCHAR2	Not Null	Details of Payment

Payment_Method

Attribute	Datatype	Comments	Description
payment_method_id	NUMERIC(2,0)	Primary Key	Payment ID of order
description	VARCHAR2	Not Null	Description of payment method used
created_on	CURRENT_TIMESTAMP	Not Null	Time when created
updated_on	CURRENT_TIMESTAMP	Not Null	Time when updated

Role

Attribute	Datatype	Comments	Description
role_id	NUMBER(16,0)	Primary Key	Unique ID for role of an account
role_description	VARCHAR2(500)	Not Null	Description of the account status
display_name	VARCHAR2(50)	Not Null	Name displayed for the account
created_on	CURRENT_TIME_STAMP	Not Null	Time when role was created
created_by_id	NUMBER(16,0)	Not Null	Person ID was created

Account _Role _Mapping

Attribute	Datatype	Comments	Description
account_id	NUMBER(20,0)	Primary Key	Unique ID for account role of an account
role_id	NUMBER(2,0)	Primary Key	Unique ID for role of an account
created_on	CURRENT_TIMESTAMP	Not Null	Time when role was created
created_by_id	NUMBER(16,0)	Not Null	Person id was created

Authentication_config

Attribute	Datatype	comments	Description
Session_id	Numeric(20,0)	Primary Key	Unique session id of account
Login_time	timestamp	Not Null	Login time of account
ip	varchar2	Not Null	Ip address
timezone	varchar2	Not Null	Time zone of account
Is_logout	NUMERIC(1,0)		Boolean (yes/ no)
Logout_time	TIMESTAMP	Not Null	Logout time of account
Account_id	NUMERIC(20,0)	Foreign Key	Account id of user

Password

Attribute	Datatype	Comments	Description
password_id	NUMBER(16,0)	Primary Key	Unique ID for password of an account
password_hash	VARCHAR2(50)	Not Null	Password hashing add a layer to protect login credentials.
password_salted	VARCHAR2(50)	Not Null	Password salted is created to protect the passwords by adding an extra bits of data
password_question	VARCHAR2(50)	Not Null	Password question is asked for two factor authentication.
password_answer_hash	VARCHAR2(50)	Not Null	Upon hashing password answer the integrity is maintained for the intended users.
created_date	CURRENT_TIMESTAMP	Not Null	Date when password was created
updated_date	CURRENT_TIMESTAMP	Not Null	Date when password was updated

Payment_Status

Attribute	Datatype	Comments	Description
payment_status_code	NUMERIC(1,0)	Primary Key	Status code of payment
status_description	VARCHAR2	Not Null	Description of payment status
created_on	CURRENT_TIMESTAMP	Not Null	Time when created

Rental_Price

Attribute	Datatype	Comments	Description
price_id	NUMERIC(16,0)	Primary Key	Price ID of Order
created_on	CURRENT_TIMESTAMP	Not Null	Time when created
price	NUMERIC	Not Null	Price value details

Patient_Details

Attribute	Datatype	comments	Description
covid_report_id	NUMERIC(8,0)	Primary Key	Covid report id of the patient
name	VARCHAR2	Not Null	Name of the patient
Address	VARCHAR2	Not Null	Address of the patient
covid_status	NUMERIC(1,0)	Not Null	Covid result status of the patient
county	VARCHAR2	Not Null	County of the patient