DAMG 6210 35199 Data Mgt and Database Design

Project

Databosses (Group 13)

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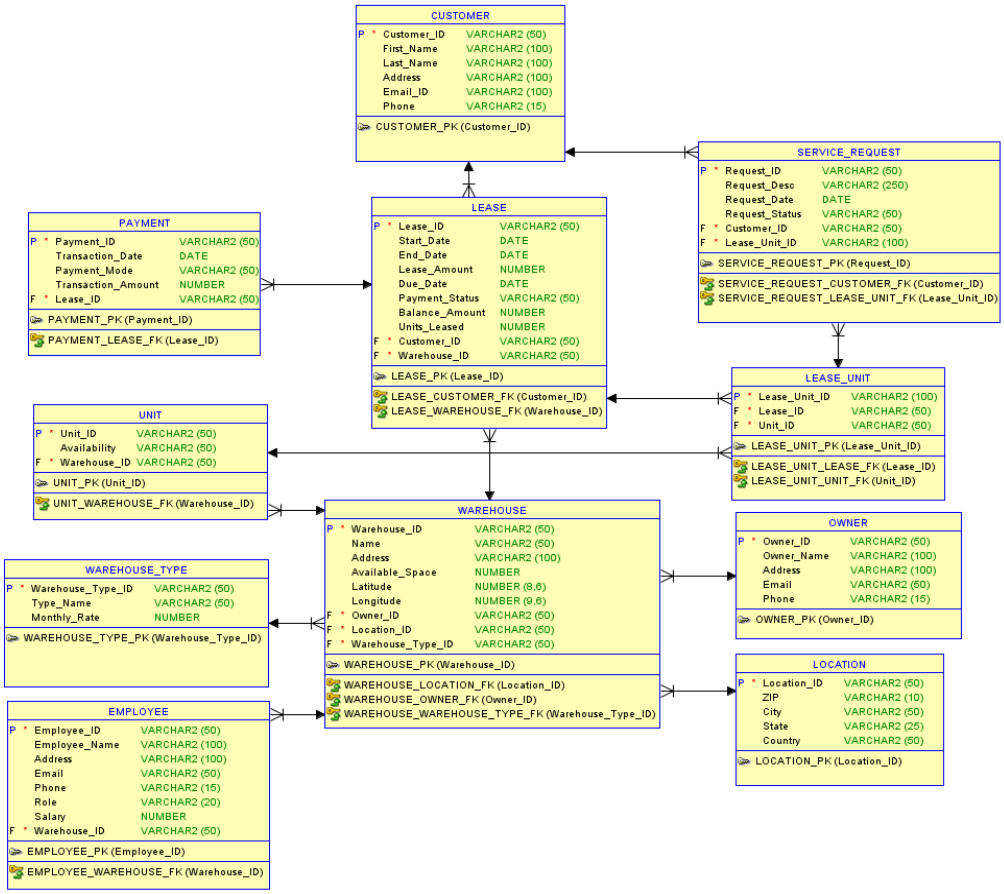
Part #1: ER Diagram



Part #2: Business Rules

1. Customer Rules:

- Every customer is uniquely identified with an ID known as Customer_ID.
- Customer details namely First_Name, Last_Name, Address, Email, Phone Number are tied to Customer_ID.
- Every customer can have multiple leases similarly a customer can lodge many service requests.

2. Service_Request Rules:

- The Customer can raise a request through their assigned Customer_ID and the time of their request is stored in Request_Date.
- Since Customers can own different units in a warehouse and different units might have different issues. A customer can refer the unit (Lease_Unit_ID) and associated issues (Request_Desc).
- Status of a particular request is known through Request_Status which can be open, closed, in-progress.

3. Lease_Unit Rules:

- Customers can lease different units (a block of space) in a particular warehouse.
- Unit_ID refers to the unit in the warehouse and Lease_ID talks about the leasing rules governing that unit for a particular timeframe.
- Considering different combinations of Unit_ID and Lease_ID, a surrogate key is introduced known as Lease_Unit_ID.
- A single Lease_Unit can have multiple Service_Request.

4. Lease Rules:

- A customer can book a lease for a particular warehouse by mentioning a time frame using Start_Date, End_Date.
- The Lease_Amount is determined by multiplying the monthly rate associated with the warehouse type by the duration between the Start_Date and End_Date, and then further multiplying the result by the number of Units_Leased.
- Due_Date specifies the date within which the entire Lease_Amount must be paid by the customer.
- A provision is given to customer for paying the Lease_Amount in installments before Due_Date thereby a particular lease can have multiple transactions made against it. When no single transaction is made the status is "UNPAID". If at least one payment is done, the status changes to "PARTIALLY PAID". When the full Lease_Amount is paid the status is displayed as "PAID".
- Balance_Amount displays the amount still needs to be paid after a transaction is done. When no transaction is done the Lease_Amount equals Balance_ Amount. When a particular transaction is done, the value of the transaction is deducted from the Balance_Amount. If the entire Lease_Amount is paid then the Balance_Amount displays zero.
- A Lease_ID is related to a particular Warehouse_ID. The number of units leased by a particular customer is known through Units_Leased**.** A lease can consist of multiple units.

5. **Payment Rules:**

- Customers can make multiple transactions against a particular Lease_ID. Transaction details such as the Transaction_Date (date when the transaction is done), Transaction_Amount (the amount paid) and Payment_Mode (Payment method such as credit, debit, cheque, etc.) are recorded.
- The entire combination is marked uniquely by Payment_ID.

6**. Unit Rules:**

- A warehouse is split into units. A particular Unit_ID is formed by the conjunction of Warehouse_ID and Availability (if the space is occupied or not).

7. **Owner Rules:**

- Every Owner is uniquely identified by Owner_ID. Owner can have single or multiple warehouses. Various other details related to the owner are recorded such as name of the owner (Owner_Name), address of the owner (Address), email address (Email) and phone number (Phone).

8. **Warehouse Rules:**

- Every warehouse is uniquely identified by Warehouse_ID and every warehouse is related to a specific Owner_ID.
- All other details describing the warehouse namely warehouse name (Name), address (Address) are recorded.
- To decrease the data redundancy. The common part of the address among various warehouses is stored in Location table and ID is generated for a unique set known as Location_ID which is introduced in the Warehouse table.
- The warehouse kind is defined by Warehouse_Type_ID.
- Precise location of the warehouse is marked by Latitude and Longitude attributes. The house number is stored in Address attribute.
- A warehouse can be a part of multiple leases.

9. **Warehouse_Type Rules:**

- A warehouse has categories namely dry storage and cold storage which are stored in Type_Name. Every warehouse can be either of the two. Consequently the price changes w.r.t warehouse type which is recorded by Monthly_Rate. The combination of the two attributes is uniquely identified by Warehouse_Type_ID.

10. Location Rules:

- A warehouse's location details are recorded such as zip code (Zip), city (City), state (State), country (Country), latitude (Latitute) and longitude (Longitude). A combination of these values is uniquely identified by Location_ID. Different warehouse within the same area can have same values for the above attributes. Only house number changes which is recorded by the Address attribute of the Warehouse table.

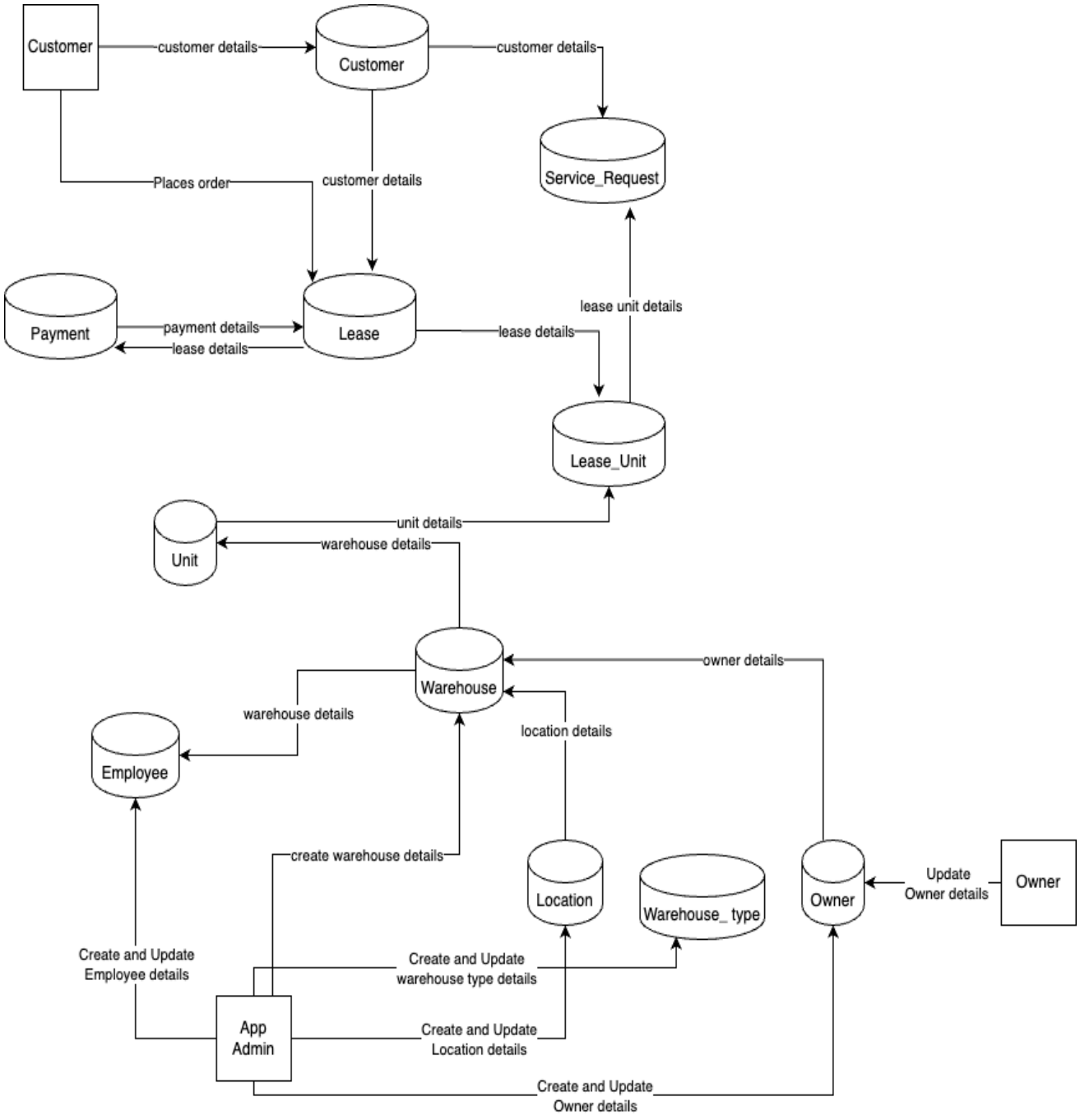
11. Employee Rules:

- All the employees are uniquely identified by Employee_ID. Various other details related to the employee are recorded such as name of the employee (Employee_Name), address of the employee (Address), email address (Email),phone number (Phone), job role (Role),associated salary (Salary) and the warehouse being assigned to is taken care by Warehouse_ID.

Part #3: Views

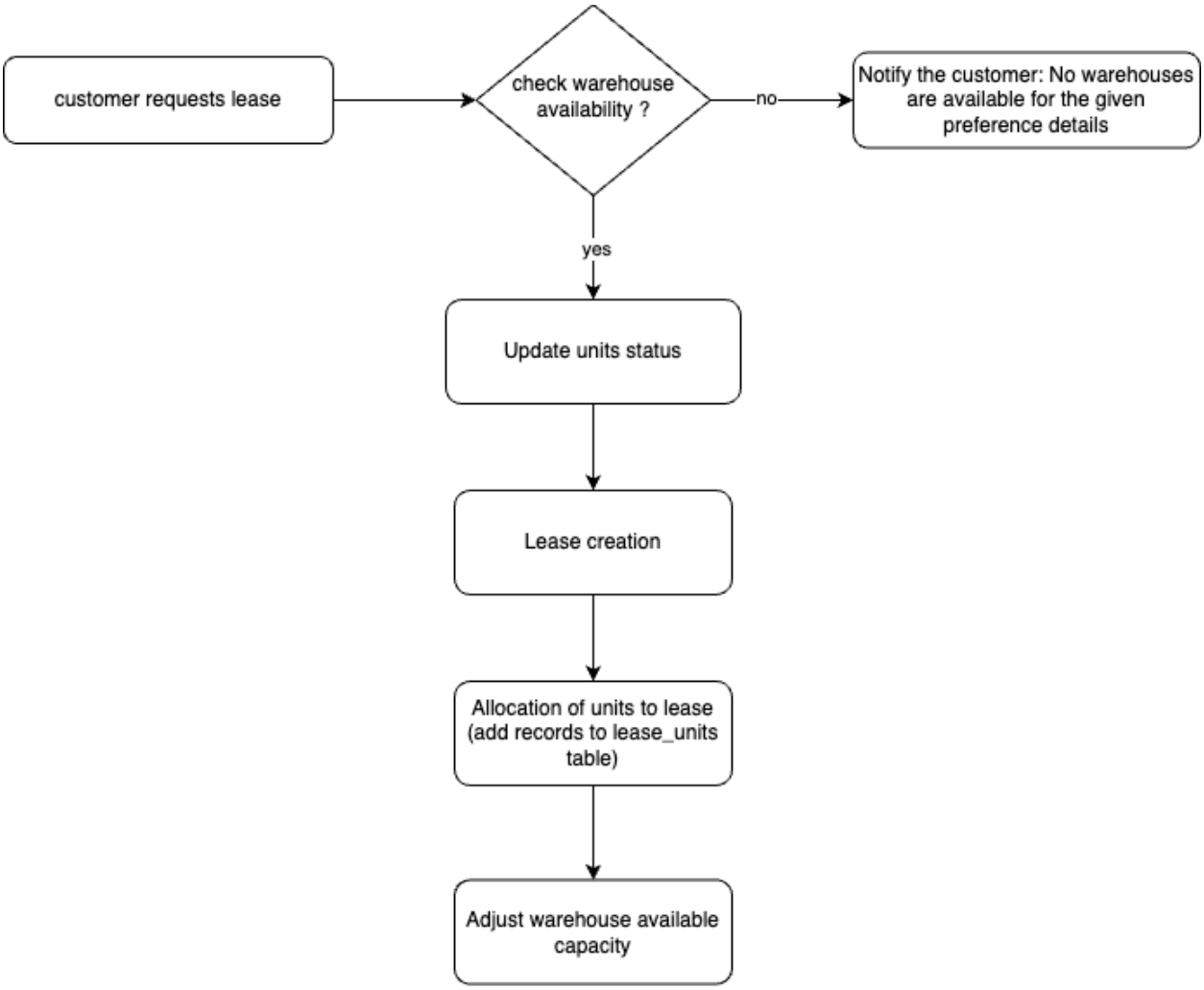
S.No	View	Description and Usage
1	Customer Lease Details View	This view provides comprehensive details of leases associated with each customer, including lease ID, warehouse details, lease start date, end date, lease amount, payment status, and any outstanding balance. It offers a consolidated overview of all active leases for a particular customer, facilitating efficient management of lease agreements.
2	Warehouse Availability by Location View	This view provides real-time visibility into the availability of warehouse units within a specified location, identified by ZIP code. It presents information such as warehouse ID, name, location, available space, and occupancy status, filtered based on the provided ZIP code. By focusing on a specific geographical area, this view assists users in quickly identifying vacant units and optimizing warehouse leasing decisions within the targeted location.
3	Owner Revenue View	This view provides insights into the revenue generated by each warehouse owner, summarizing total earnings from lease agreements over a specified period. It includes details such as owner ID, name, total revenue, and breakdown of revenue by individual leases, enabling owners to track their earnings and make informed business decisions
4	Payment Summary View	This view offers a concise summary of payments made towards lease agreements, showcasing transaction details such as payment ID, lease ID, transaction date, payment amount, mode of payment and payment status. It serves as a valuable tool for monitoring payment activity, reconciling accounts, and ensuring timely processing of payments.
5	Lease Units Available/Status View	This view presents a list of available warehouse units for lease, displaying unit details such as unit ID, warehouse ID, availability status, and associated lease information (if leased). It assists users in identifying vacant units and expediting the leasing process by providing up-to-date information on unit availability.
6	Service Request Status of Warehouse View	This view offers visibility into the status of service requests associated with each warehouse, providing details such as request ID, warehouse ID, request description, request date, and current status. It enables warehouse employees to track the progress of service requests, prioritize tasks, and ensure timely resolution of maintenance issues.

Part #4: Data Flow Diagram



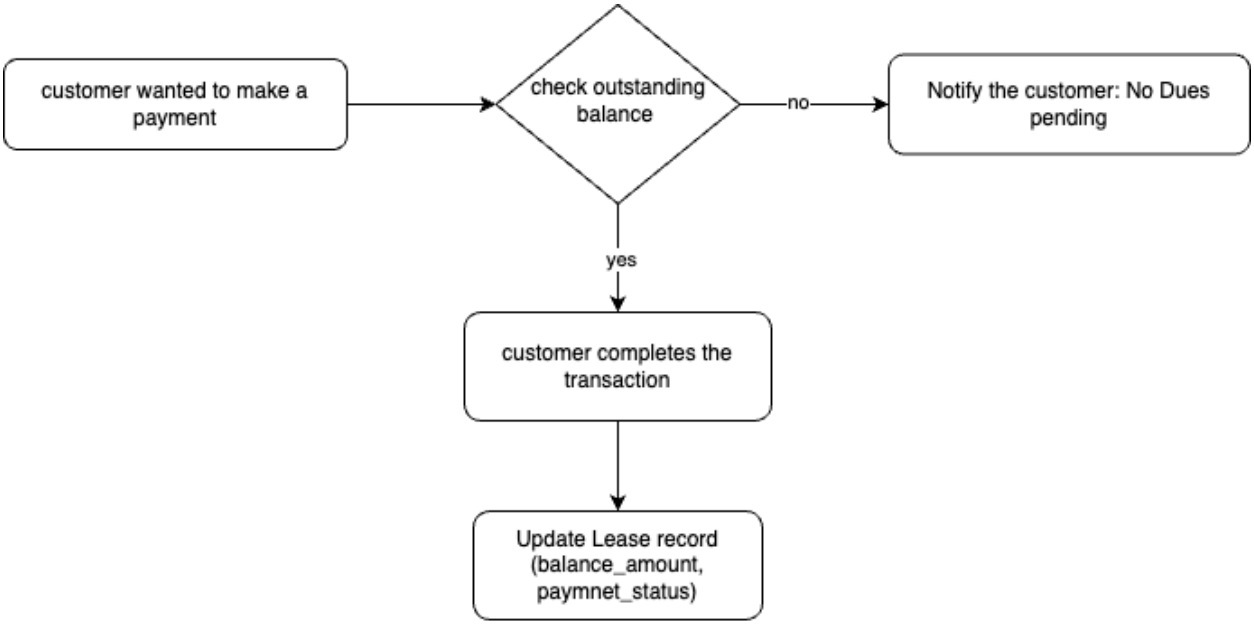
Part #5: Flowcharts

5.1 Customer Leasing a warehouse



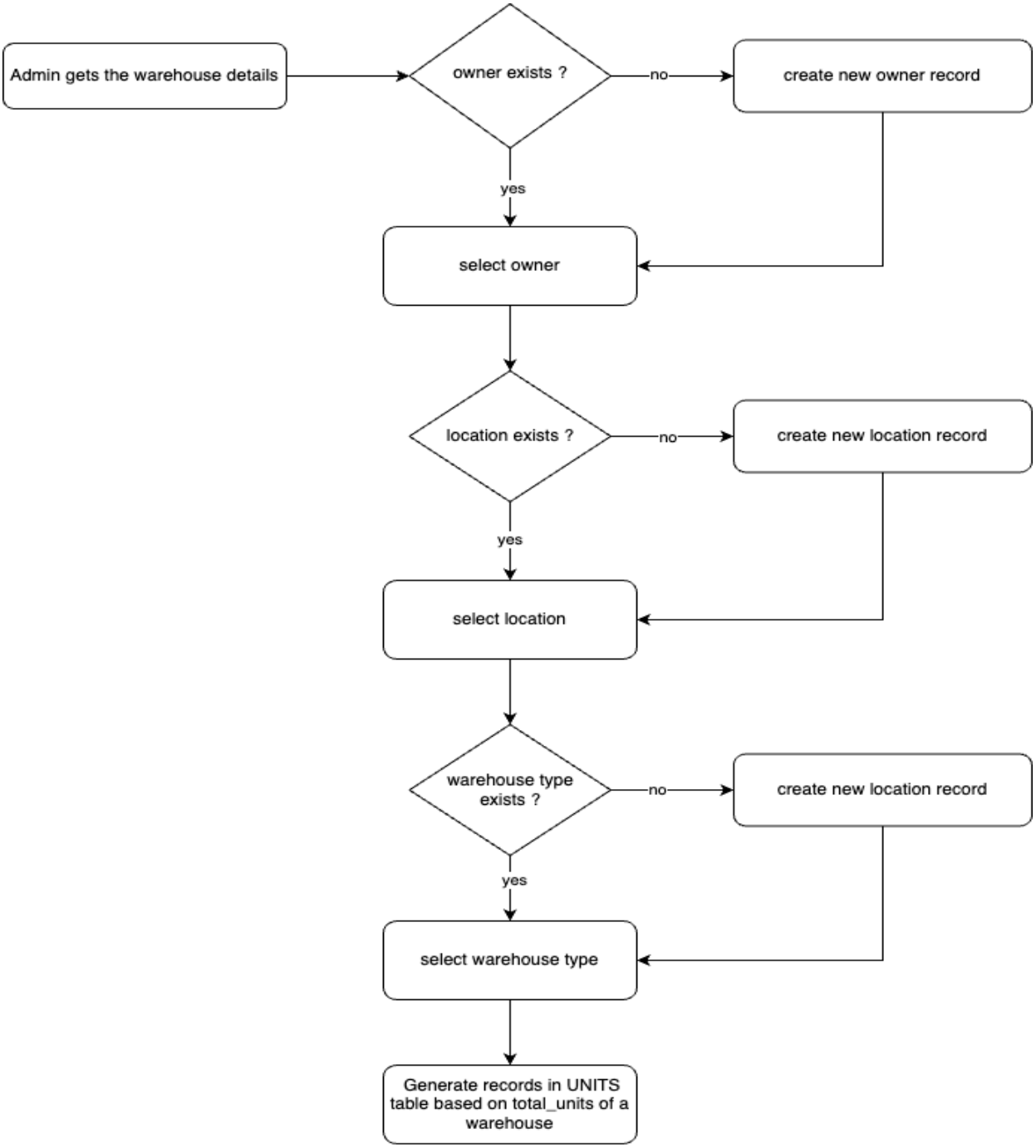
Customers leasing a warehouse flowchart

5.2 Customers Making a Payment



Customers making Payment flowchart

5.3 Adding a New Warehouse



Adding a new warehouse flowchart

Part #6: Security (Roles and Permissions)

To maintain the security for our Database project, we are implementing **Role-based Access Control (RBAC)**

6.1 Identifying Roles:

1. **Customer**: A customer is a user who leases warehouse units and interacts with the system primarily to manage their lease agreements and associated data.
2. **Owner (warehouse)**: An owner is a user who owns one or more warehouses and monitors lease agreements, other relevant information related to their properties.
3. **App Admin** (Super User): An App Owner is a user who represents the super user role with elevated privileges for managing the application, including configuration, user management, and administrative tasks.

6.2 Access Control:

1. Customer Access:

    - Edit Personal Data: Customers have permission to edit their personal information, such as first name, last name, address, email, and phone number, stored in the customer table.
    - Read Lease Records: Customers can view lease records associated with their account, including lease start date, end date, lease amount, payment status, and outstanding balance.
    - Read Service Requests: Customers can access service requests submitted by them for maintenance or support purposes.
    - Read Payments: Customers can view their payment history, including transaction details, payment amounts, and payment statuses.

2. Owner (warehouse) Access:

    - Read Lease Records: Owners have permission to view lease records associated with their warehouses, allowing them to monitor lease agreements, occupancy status, and financial details.
    - Update Owner Record: Owners can update their own records in the owner table, enabling them to manage their contact information and other relevant details.

3. App admin (Super User):

    - User should be assigned the super user role to grant them elevated privileges for managing the application.
    - User should have the authority to manage user roles and permissions within the system.