

Data Management and Database Design

P3: Final ERD (Logical Model)

Group 20:

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Community Management System

Summary of Changes:

1. Enhanced Payment Management:

The "Payment" entity is extended to accommodate diverse transactions within the system, including monthly maintenance fees, service request fees, and amenity booking fees.

Payment entity: Acts as a parent for specialized entities, inheriting common attributes like amount, status, payment method, and resident ID.

MaintenanceFee (Subtype): Manages monthly fees associated with each apartment, including tracking unpaid amounts for partially paid invoices.

ServiceRequestFee (Subtype): Manages fees tied to service requests submitted by residents and handled by staff.

AmenityBookingFee (Subtype): Handles charges related to amenity reservations by residents.

Key improvements:

Enables management of diverse financial transactions within a single framework.

2. Enhanced Vehicle Management:

Introduced the "ParkingSlot" entity to manage parking for both residents and visitors. Slot allocation happens based on "Type" attribute and the possible values for it are "Resident" or "Visitor".

ReservedParking: Each Apartment would be assigned some reserved parking slots which can be exclusively available to residents living in that apartment. This entity will manage the allocation of parking slots to resident's vehicles.

VisitorParking: Visitor vehicles will be allocated a parking slot dynamically on a first-come, first-served basis. Ideally, the number of parking slots available for visitor vehicles would be in excess (let's say 30 more) than that of number of reserved parking slots. The allocation of parking slot to a visitor vehicle is only permitted till the exit time of the visitor and cannot exceed that time.

Key improvements:

Optimizes parking space usage by allocating visitor slots only when unavailable for assigned residents.

3. Visitor to Resident Relationship:

The previous many-to-many relationship between Visitor and Resident is replaced with a "VisitorLog" entity. This associative entity streamlines tracking of resident-visitor interactions.

4. Fixed Relationships and Cardinalities:

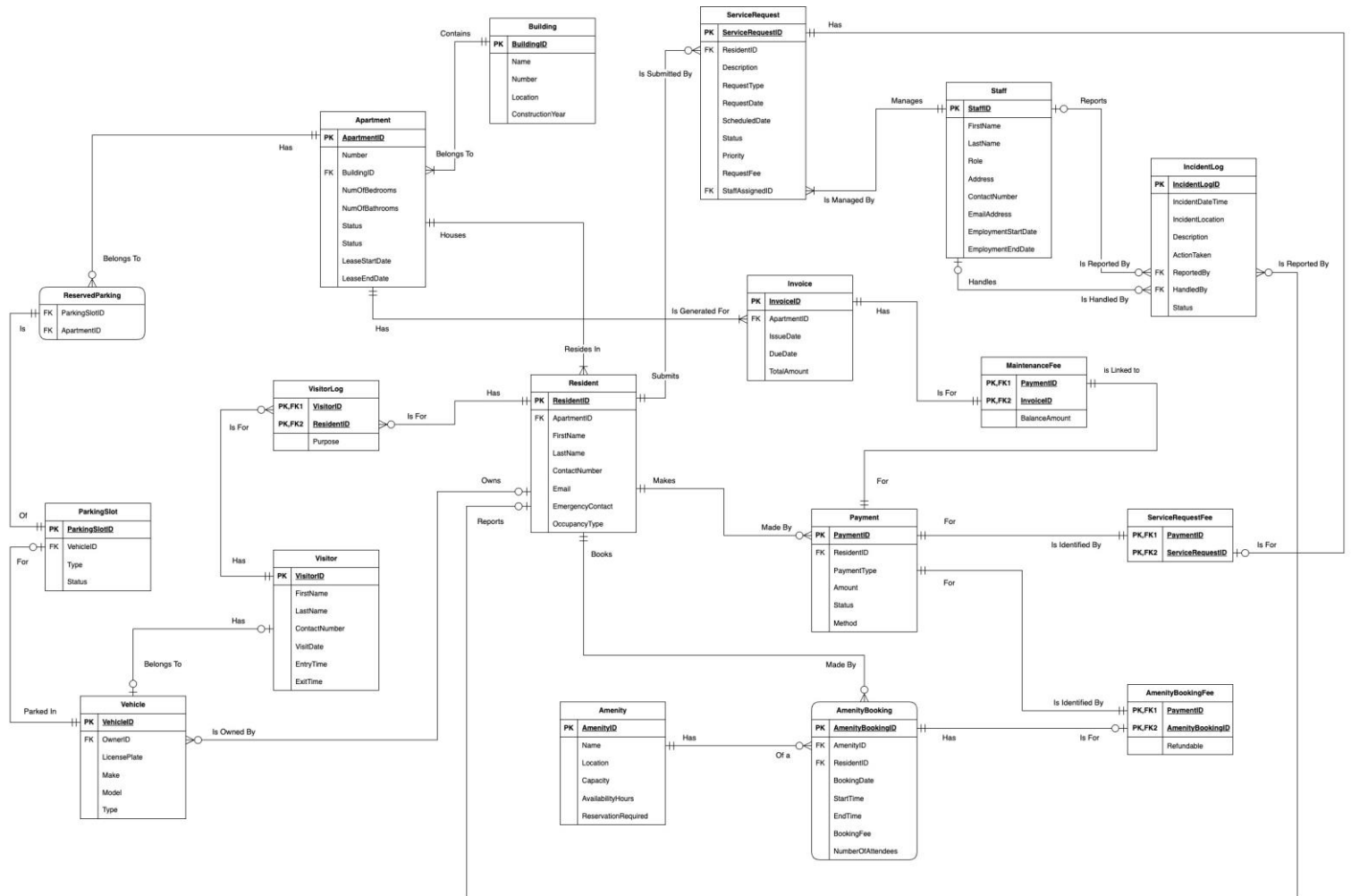
Apartment to Resident: Removed ResidentID attribute from Apartment entity and added ApartmentID attribute in Resident entity to track many residents living in one apartment.

Resident to AmenityBooking: Changed to a one-to-many (optional) relationship. Residents can make multiple bookings, but it's not mandatory.

ServiceRequest to Apartment: Decoupled to allow requests for issues beyond specific apartments. A "RequestType" attribute categorizes requests (e.g., electrical, plumbing, common area) for efficient resolution.

Overall, these changes enhance the system's flexibility, efficiency, and ability to manage diverse transactions and interactions.

Final E-R Diagram



Link to High Quality JPEG:

<https://github.com/PriteshNU/DAMG6210-Spring2024-Group20/blob/main/Documents/FINAL%20ERD.jpg>