DataBase Foundations
Workshop No. 1 - Database Desing

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User stories:

1. As resident, I want notify management and the security that I'm going to receive a visit, add the name and document number of the person, so that that they can authorize the entry quickly and safely, without having to wait at the entrance.

2. As resident is paying the apartment to installments, I want to easily check how much I've paid, the interest begin charged, and all details about my payments, so that I can understand my money situation with a fast and easy to use app.

3. As resident, I want to get notifications about home tasks, like a task manager for household chores or availability of things and spaces, so that I can keep track of everything easily. It would be awesome to have artificial intelligence to help me manage tasks even better.

4. As a resident, I want to filter apartments by size and price, so that I can quickly find the one that fits my budget.

5. As a resident, I want to receive notifications about important events or news from the complex and the neighborhood, so that I can always know what is happening around me.

6. As a resident, I want to check the availability of parking spaces and reserve one for my visitors, so that I can make sure there is always a space for them.

7. As a resident, I want to receive notifications about events in the complex, like meetings or important announcements, and have access to a social forum to see activities in the neighborhood, so that I can join community life and stay informed about what's happening.

8. As a resident, I want to send a complaint (like a PQRS) to the administration in real time when there are problems in common areas, so that issues can be solved quickly and efficiently.

9. As a resident, I want to first choose from a list of possible damages and then specify the condition, so that the right person can be contacted to fix the problem.

10. As a resident, I want to have a section where I can see if there are any messages or packages waiting for me at reception, so that I know when to pick them up.

11. As a resident, I want to create events and share them in the app, so that other people can join my event.

12. As a resident, I want to see all the administration contacts in the app, so that I can easily reach them when I need help.

13. As a resident, I want to report problems in common areas through the app by sending an email to the administrator, so that the issues can be fixed quickly.

14. As a resident, I want to request concierge services through the app, so that I can get assistance easily.

15. As a resident, I want to book common spaces through the app, so that I can use them whenever I need.

Functionalities:

1. List of apartments: Shows all available apartments in the complex.

2. List of blocks: Displays the different blocks in the apartment complex.

3. Administration payments: Allows residents to pay for administration services.

4. Utility bill payments: Residents can pay for water, electricity, etc.

5. Reservation of common spaces: Residents can reserve common areas like gyms,parking, or event rooms, etc.

6. Visitor registration and arrival notification : Registers visitors and notifies residents when they arrive.

7. Installment apartment payment management: Manages payments in installments, including the amount paid, interest, and pending payments.

8. Household task scheduling: Allows users to set schedules and responsibilities for home tasks and receive reminders.

9. Filter apartments by size and price: Helps users find apartments based on size and price.

10. Event management: Residents can promote events, view community news, and receive notifications about events.

11. Common area issue reporting (PQRs): Users can report problems of common areas.

12. Package or delivery notification: Notifies residents when packages or deliveries are at the reception.

13. Administration contact list: Provides a list of contacts for administration services.

14. User counseling service: Offers guidance or advice services for residents.

Technical and design considerations/decisions:
For the data design, we will use a relational database. This type of database helps organize most of the data in tables, like apartments, blocks, payments, and visitors. It makes the data easier to find and manage. Some data, like event posters or payment receipts, will not fit into tables. This unstructured data will be saved outside the main database in a different system, and we will add links to it in the main database.

CRUD Operations: CRUD (Create, Read, Update, Delete) will be used to manage visitors and events. Users can create new events or visitor records, update them, or delete them when needed. This makes it easy to manage the data.

Performance Considerations: To make the system faster, we will use indexes on important columns, like apartment IDs or user IDs. We will also make sure the data is well organized and not repeated. For large files, like images, we will store only links to the files instead of saving them directly in the database.

Database design:

1. **Components:**
    - Service.
    - User.
    - PQR.
    - Notification.
    - Apartment complex.
    - Payment.
2. **Entities:**
    - **Service:** Parking,GYM,sport field,community room, events, utility bills, HOA fees, counseling.
    - **User:** Resident, visitor, property manager.
    - **PQR:** Report.
    - **Notifications:** Deliveries, events, reminders.
    - **Apartment complex:** Apartment, block.
    - **Payment:** Payment.
3. **Attributes per entity:**
    - E_1 **Parking:** location, duration, price, vehicle type.

- E_2 **GYM:** Name, availability, duration, opening time, closing time, reservation, maximum capacity, equipment, location.
- E_3 **Sport field:** Name, type field, availability, duration, reservation, maximum capacity, location.
- E_4 **Community room:** name, reservation, duration, maximum capacity, availability, location.
- E_5 **Events:** name, description, date, hour, location.
- E_6 **Utility bills:** name, type, Price, date.
- E_7 **HOA fees:** name, price, date.
- E_8 **Counseling:** advisor Name, duration, date, hour, speciality, availability, location.
- E_9 **Resident:** name, email, number phone, number document.
- E_{10} **Visitor:** name, email, number phone, status, number document.
- E_{11} **Property manager:** name, email, number phone, office hours, location.
- E_{12} **Report:** name, type, description, date, status.
- E_{13} **Deliveries:** Name, type, description, date, status.
- E_{14} **Reminders:** Name, type, description, date, hour, location, status.
- E_{15} **Apartment:** number, size, price, location, status, room, bathroom, hall, kitchen.
- E_{16} **Block:** name, apartments number, floors number.
- E_{17} **Payment:** name, status, type, price, date, payment method.

4. **Define relationships:**

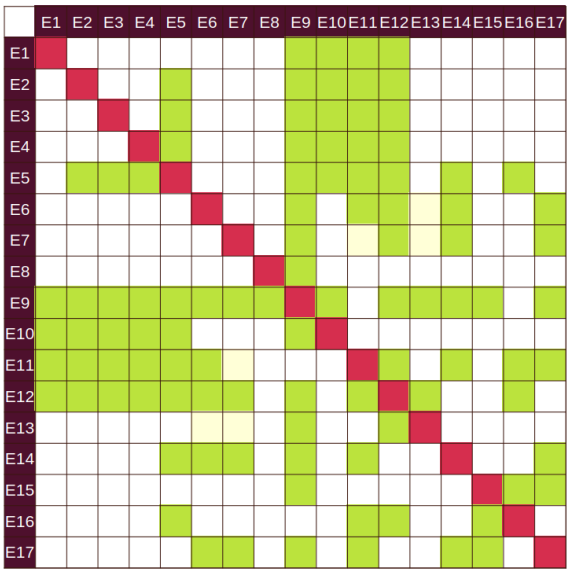

Figure 1: Relationships

5. **Define relationships types:**

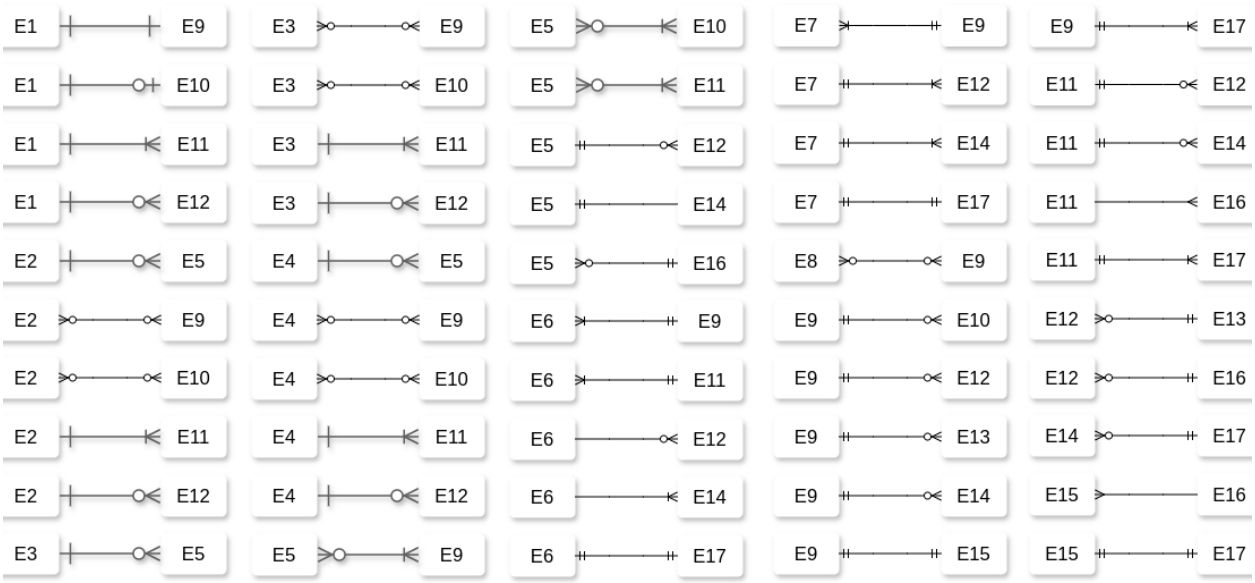

Figure 2: Relationships types

6. **First Entity-relationships Draw:**

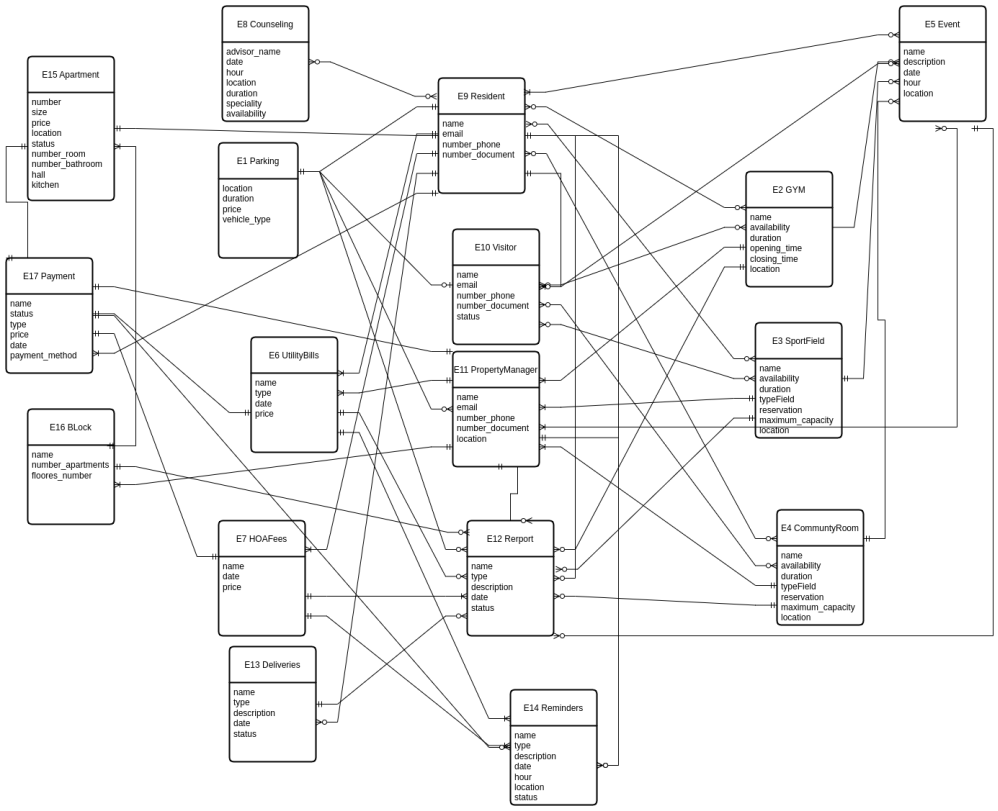

Figure 3: First Entity Relationships Draw

7. **First split many to many relationships**

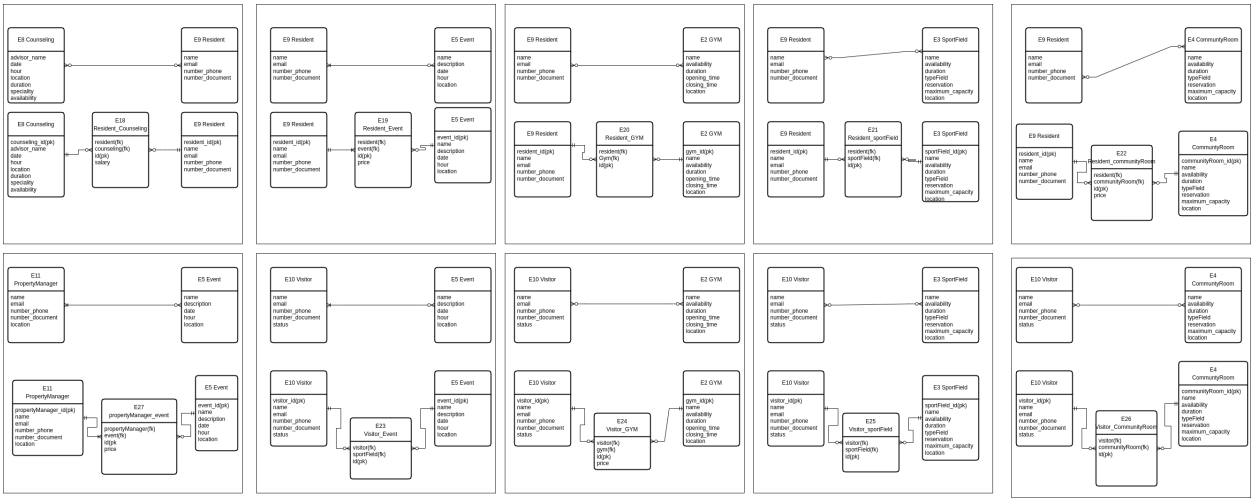

Figure 4: split many to many

8. **Second Entity-relationships Draw:**

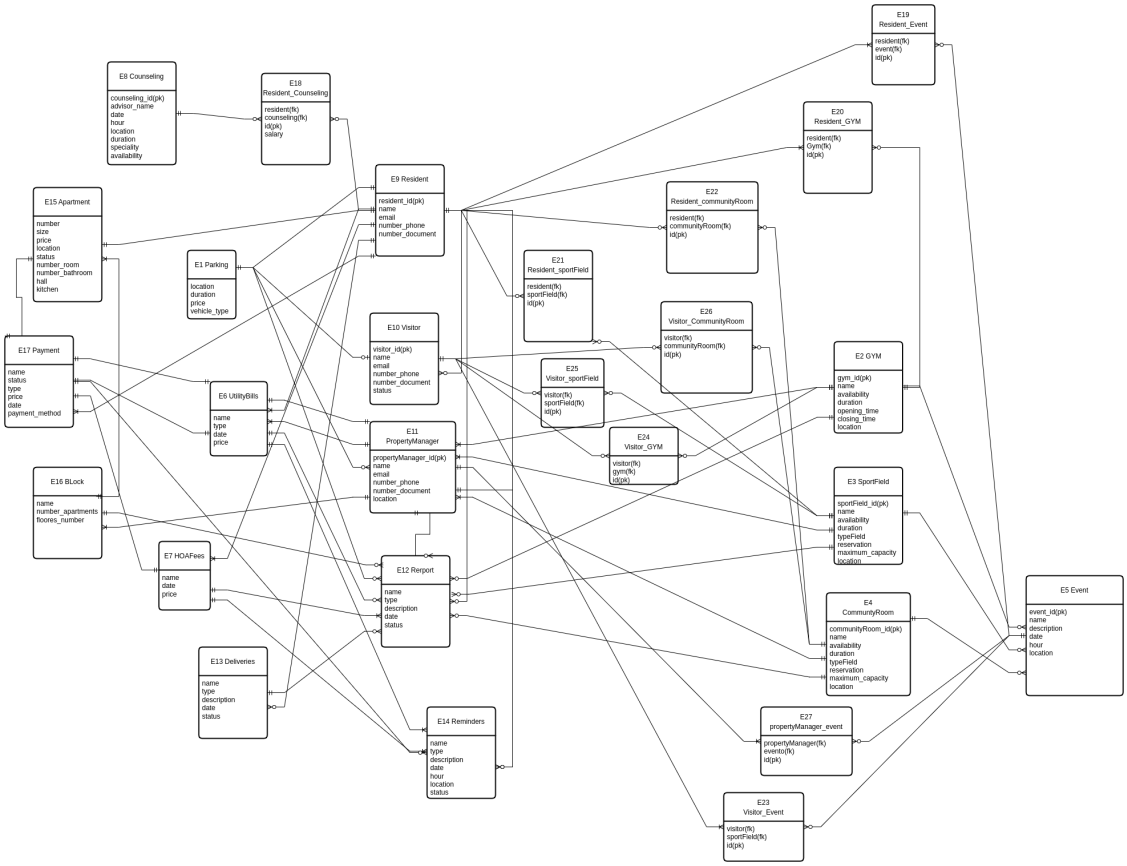

Figure 5: Second Entity relationships

9. Get data-structure ERM

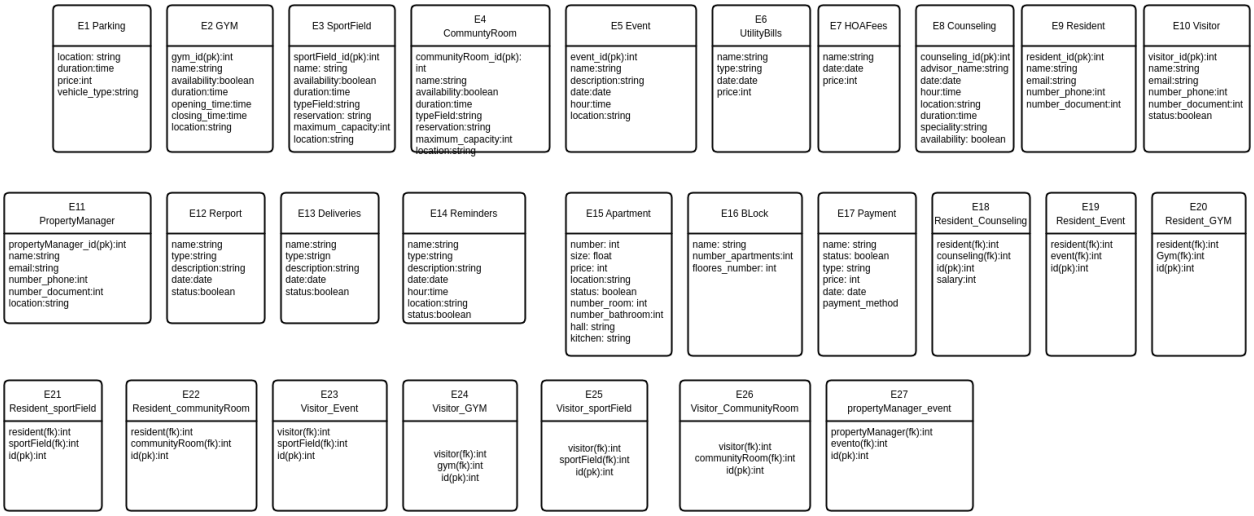

Figure 6: Get data structure ERM

10. Define constrains properties of data

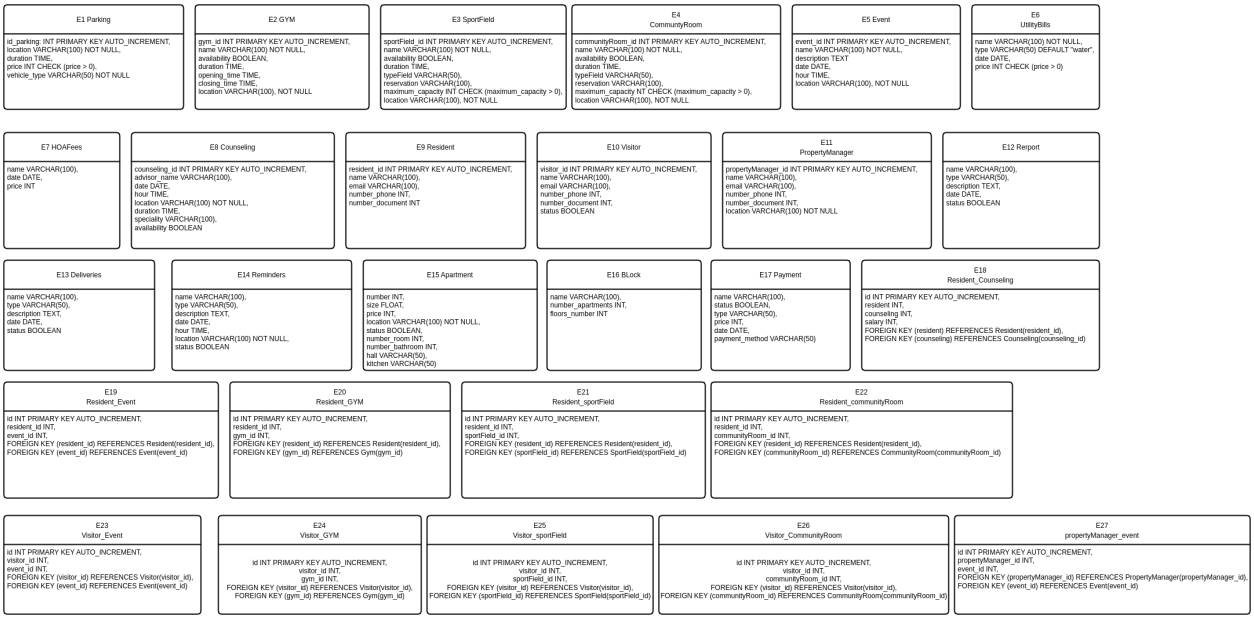

Figure 7: Caption