CS 4347.004 Database Systems
Project Part 1: Updated Proposal – Team 7

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PROJECT PROPOSAL

Problem Domain and Solution – – business description and business rules at the complexity level of the Hospital example on the last page of this document. Provide a full narrative of your mini-world.

This is a mini-world for a hotel that offers multiple state-of-the-art services, with multiple employees and managers overseeing each service to ensure the best service for the important guests of the hotel. The hotel has hundreds of rooms of various sizes, offering different amenities for very reasonable prices. We treat all our guests like VIPs, offering premium valet, concierge, and 24/7 housekeeping. We also have private chefs on-site to whip up any food that the guests want. We also offer a spa for guests to be able to relax and have a great experience at our hotel. Guests can choose to reserve through a third-party reservation system or reserve directly. Give our hotel a chance and experience luxury!

Business Rules
- Each guest must have a full name, home address for lost items, phone number, credit card information, room number, car model, and loyalty program points.
- Each room must have a daily rate, a room number, and a duration of stay for the guest.
- Each employee must have a department they work in, a full name, a work schedule, an employee ID, and their role.
- Each department must have a name, main office, phone number, head of department, and budget.
- ~~The hotel must have an address, hotel code, and phone number.~~
- Each room must have a daily price, a room number, and a start/end date of a guest's stay
- The concierge must check-in and check-out guests, coordinate guest requests, and keep track of any expenses to guests.
- Housekeeping must clean rooms and listen to guest requests for the state of the room.
- The cook must cook food that the guest requests and prepare breakfast, lunch, and dinner for the staff.
- The valet must park guests' cars and interact with the guests to store information about the car and associate it to the correct guest.
- ~~Some guests may make reservations through a reservation company, which is represented by an agent~~

Identify major entity types - For each entity type describe what is it, what does it do in the mini-world, how does it interact with other major entity types?
- The GUEST entity represents the individuals who visit the hotel. The guest entity uses different facilities provided by the hotel. Some attributes of the guest entity include first and last name, address, phone number, credit card information, room number, ~~car model~~ license plate, loyalty program points, and guest_id (which is based on their driver's license id or state id number). The guest interacts with the reservation company to reserve a room with the hotel, the concierge to check-in/check-out, and the room where they will stay.
  - Some guests will drive a CAR entity, which drives guests to the hotel. The car entity drives the guests, and it also interacts with the valet employees so it can be properly

parked. The attributes of the car entity are parking id, color of car, car model, license plate.

- The ROOM entity is a representation of the rooms that are in the hotel for guests to stay in. A room has a daily price, a room number, and a start/end date of a guest's stay. The room entity interacts with the concierge, who enters the start/end date of a guest's stay.
- Another major entity is the EMPLOYEE, which represents the people who work in the hotel. Some specializations of the employee entity are CONCIERGE, HOUSEKEEPING, COOK, MASSAGE_THERAPIST, and VALET. The employees in the hotel are there to provide services to guests and ensure the maintenance of the hotel. All employee entities have the following attributes: First name and last name, shift slot, and employee id(which is their SS), and role(manager, assistant manager, or none).
  - The role of the CONCIERGE is to check-in/check-out guests, and to coordinate guest requests such as room cleaning or room service. They primarily interact with guests to answer any questions and the reservation company to make reservations for guests. Has a foreign key of employee id.
  - The role of HOUSEKEEPING is to clean empty rooms. They interact with the room entity.Has a foreign key of employee id.
  - The role of the COOK is to provide food to the guests. They interact with the concierge entity– who tells them which rooms to deliver food to– and the room itself to deliver the food. Has a foreign key of employee id.
  - The role of the VALET is to park the guest's cars. The valets interact with the car entity, as well as the guest entity that tells them when they want their car retrieved from parking. Has a foreign key of employee id.
  - The role of the MASSAGE_THERAPIST is to provide massage services to the guests of the hotel. The massage therapists interact with guests. Has a foreign key of employee id.
- The DEPARTMENT entity represents the specific decision of the hotel. Each department has a name (front desk, spa, restaurant, housekeeping), main office, phone number, head, and budget. Each employee will work in one department, and the guests can also interact with the department for information or to request services.
- ~~The HOTEL entity represents the overall hotel where guests and employees stay and work respectively. Some attributes of the hotel entity are the address, hotel code, and phone number, and any Social Media.~~
- ~~The RESERVATION_COMPANY entity represents the reservation service guests can use to book a stay at the hotel. The company interacts with guests who use the service, and the concierge to book a room.~~
- The CONTACT entity represents the contact information of the hotel. The concierge manages this information.
- The PAYMENT entity represents the payment information that is made in the hotel.
- The EVENT entity represents the events that occur in the hotel.
- The FEEDBACK entity represents the feedback guests can provide to the hotel. The department can take action based on the feedback responses.

Assumptions on how many tables and relationships will be discovered.

Assumptions on volumes of data: for example, we estimate treating 2,000 patients each year, and employing 400 nurses a year.

Volumes
- Guest → We estimate serving 2000 guests per month.
- Room→ There are 313.1 rooms per hotel in the upper upscale chain type in the United States. We consider our hotel to provide premium services for a reasonable price, so we estimate the hotel will have 200 rooms.
  - Source: https://www.statista.com/statistics/823786/average-number-of-rooms-per-hotel-by-chain-type/
- Employee →The average Hotels & Motels business in the US has 13.3 employees. The hotel will be a medium sized business that employs 45 workers a year.
  - Source: https://www.ibisworld.com/industry-statistics/employment/hotels-motels-united-states/

Relationships
- A Guest can book one or many Rooms.
- A Room can be booked by one Guest.
- An Employee works in one Department.
- A Department has one or many Employees.
- A ValetDriver is a specialization of Employee.
- A Housekeeping employee is a specialization of Employee.
- A Concierge employee is a specialization of Employee.
- A massage_therapist employee is a specialization of Employee.
- A massage_therapist employee serves zero or many Guests.
- A Housekeeping employee is responsible for maintaining many Rooms.
- A Concierge employee can provide zero or many Services to Guests.
- A ValetDriver employee can assist with the parking and retrieval of zero or many Guest vehicles.
- A Room can be cleaned by one or many Housekeeping employees.
- A Guest can request zero or many Meals from the Cook.
- A Guest can request zero or many Services from the Concierge.
- A Guest can have zero or many Vehicles parked and retrieved by the ValetDriver.
- A Guest can own zero or many Cars.
- A Car can owned by one or more Guests
- Guest can leave zero or more feedbacks
- Multiple Departments take action from multiple feedbacks
- Guests have one or more their own payment
- Concierge manage one hotel's contact
- Hotel manage their inventory
- Each Event is scheduled by one Department
- Department can schedule multiple Events
- Guests can get one or more item from inventory
- Multiple Payment methods can be used to make payment.

- A Contact managed by one or more Concierge

Number of Tables
- We estimate that we will use around 25 tables. There are 10 entities, five specialization entities, and some tables for relations that have several additional foreign keys.

Summary of what your project will achieve or what you will provide to eventual users of the database.
- This project is aimed to help the hotel enable efficient management of hotel operations. This database helps to manage hotel operations(the department or employees) and improve guest experiences.
- The eventual users would be the employees of this hotel, especially the concierge. This is because the concierge has the role that controls the entire part of the hotel. When a guest makes a reservation and checks in, they can be provided various information such as which room this customer is staying in, which room service was ordered, and whether they valet parking. Even when a guest checks-out, the database of empty rooms is delivered to the housekeeper so that it makes the housekeeper clean up the checked-out room. With this database, hotels can operate more efficiently in managing hotels, and hotel can also analyze the data to improve the guests' experience.

The name of DBMS (PostgreSQL, Oracle, MySQL etc.) your team will be using for the project, summary of why we chose MySQL
- Our team will be using MySQL to develop the project. We decided to use MySQL because of a few determining factors. MySQL is a free DBMS, and as university students we believe this feature is quite beneficial to us. Another reason why we decided to use MySQL is because of its high efficiency. Creating a database system for a hotel requires a lot of data and operations, and we believe that using a high performing DBMS will ensure that we can provide optimal results.