**Group C: Last Resort Hotel (LRH) - Database Analysis Report**

**Understanding of the Whole Business**

Last Resort Hotels operates globally, managing large hotel complexes that offer luxury accommodations alongside conference, event, and recreational facilities. Due to rapid growth, the company requires a robust system to track reservations, room assignments, facility usage, guest activities, and billing. The goal of our database design is to support efficient operations while maintaining flexibility to meet customer needs.

Each hotel complex consists of multiple buildings, floors, and wings, with rooms uniquely identified by their wing, floor, and room number. Proximity factors, such as access to pools, parking, and smoking policies, are standardized across floors. Room types include sleeping rooms, meeting rooms, and suites—some of which can function interchangeably based on guest needs. Certain meeting rooms feature movable walls, necessitating careful tracking of adjacency relationships. The Room\_Adjacency table helps manage these connections, ensuring seamless room transitions.

Hotels offer a wide range of facilities, including banquet halls, courtyards, swimming pools, fitness clubs, and retail stores. The Facility table records guest usage of these amenities, including temporary modifications such as rollaway beds. Reservations for sleeping rooms and meeting rooms are recorded in the Sleeping\_Reservations and Meeting\_Reservations tables, ensuring room availability is accurately tracked. Additionally, room reassignments are logged in the Room\_Reassignment\_Log to facilitate smooth guest transitions without affecting billing.

To support financial transactions, every guest service, facility usage, and room charge is recorded in the Transactions table. This enables flexible split billing, ensuring accurate cost allocation. Events hosted at the hotel have designated hosts, durations, attendance records, and associated room usage. The Event\_Facility\_Usage table captures these details, including applicable discounts, such as complimentary non-eating slots for paid eating slots or room charge reductions based on guest affiliations.

Guest and host details, including contact information, visit history, membership levels, and payment timeliness, are stored in the Guest and Host tables. This information helps determine deposit requirements and enhances customer relationship management. Guests are issued unique PIN-based keycards, recorded in the Card\_Reader table, to track movements within hotel facilities. Staff also use magnetic cards to log room readiness, ensuring efficient housekeeping and maintenance.

By integrating these elements into our database design, we provide Last Resort Hotels with a structured yet adaptable system that enhances operational efficiency, improves guest experiences, and ensures accurate financial management.

**Challenges and Conflicts Identified**

During the design phase, we encountered several inconsistencies and ambiguities in the business description that required careful consideration:

1. **Room Type Flexibility:**
   * The business description states that meeting rooms can be used as sleeping rooms if they have toilet facilities. However, it also states that rooms with fixed beds cannot serve as meeting rooms. To address this, we decided to include an attribute in the Rooms table that indicates whether a room can switch functions, with constraints ensuring the transition is valid.
2. **Room Adjacency and Movable Walls:**
   * Some meeting rooms have movable walls that divide them into smaller rooms, with doors connecting them. To accurately track these relationships, we introduced a Room\_Adjacency table that records adjacency based on private doors, shared walls, or hallway access.
3. **Billing and Split Payments:**
   * The business description mentions that split billing can occur in various ways but does not specify the structure. Our solution was to implement a Transactions table where each charge is linked to both the service provider and the responsible party, allowing for flexible billing arrangements.
4. **Reservation System and Availability Tracking:**
   * Since reservations can be made up to two years in advance and specific room assignments are done later, we needed a system to manage availability dynamically. We introduced a Room\_Status table to track whether a room is occupied, under maintenance, or undergoing renovation.
5. **Discount Calculation for Meeting Room Usage:**
   * Discounts are granted for multiple non-eating time slots and free slots for paid eating times. However, the exact discount structure was not explicitly defined. We decided to defer automated discount calculations to a later phase, allowing staff to apply discounts manually for now.

**Assumptions Made in the ERD Design**

To handle the ambiguities encountered, we made several assumptions to guide our database design. We assume that the base rental rate per day for a certain room type remains unchanged over time. Every facility, including essential amenities such as toilet and bath facilities, telephones, televisions, closets, and drawers, has a unique code, including rollaway beds. Additionally, each hotel has either an outdoor or an indoor swimming pool, but not both. The smoking policy is standardized across each floor, meaning all rooms on the same floor follow the same smoking designation. To maintain security and tracking accuracy, every customer’s PIN must be unique.

**Deferred Considerations for Future Phases**

Certain aspects of the system require further development in later phases. A major challenge is implementing the transformation between meeting rooms and sleeping rooms. According to the business description, meeting rooms with toilet facilities can be used as sleeping rooms with rollaway beds. Our current approach includes attributes in the Rooms table to define whether a room can serve both functions, but an automated solution for validating these transitions would improve efficiency. Similarly, discount calculations and free hour allocations for meeting room usage remain a complex issue. In future iterations, we aim to develop an automated system that applies discounts and tracks free usage slots when usage surpasses predefined thresholds. Lastly, enforcing boolean constraints on attributes such as smoking policy and accessibility should be implemented with system validation rules to prevent inconsistent data entry. These future enhancements will refine the system’s accuracy and usability, ensuring that Last Resort Hotels operates with maximum efficiency and flexibility.

**Team Assignment for Milestone 1**

* Helen – Wrote part of the analysis report; contributed to the initial schema by defining tables, attributes, and relationships based on the project description.
* Sianna – Developed the initial schema, including tables, attributes, and relationships; wrote part of the report, reviewed, and finalized the analysis report.
* Shen – Wrote part of the analysis report; contributed to the initial schema by defining tables, attributes, and relationships based on the project description.
* Tristan – Reviewed and validated the initial schema; summarized the tables and relationships and actualized the ERD in LucidChart.