**US-West Hotels Database Project Report**

**Requirement Analysis and Conceptual Design**

**Project Overview:**

The US-West Hotels Database project focuses on the analysis, design, and implementation of a database for a fictional hotel chain, US-West Hotels, operating in western states of the United States.

**Entity-Relationship Diagram (ERD)**

The ER Diagram below shows the current design of the US-West Hotels database. The database is used for management of the hotels in the hotel chain. The design allows tracking of the suites, hotels, hotel suites, cleaning staff and hotel clients of the hotels in the US-West Hotels chain and relationships among these entities.

Diagram

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**Requirements:**

1. Hotel Information
   1. Hotel ID – unique identifier
   2. Hotel address
   3. Number of rooms
2. Suite Information
   1. Suit number - partially unique: unique within the hotel
   2. Number of beds
3. Hotel Client Information
   1. Hotel client ID
   2. Hotel client name (Composed of first name and last name)
   3. Hotel client address
4. Staff Information
   1. Staff ID
   2. Staff name (Composed of first name and last name)
5. Booking Information
   1. Check-in date
   2. Check-out date
6. Each *hotel* has one or more *suites*. Each *suite* is located in exactly one *hotel*.
7. Each *suite* is booked to one *hotel client* or to no one. Each *hotel client* books between zero and many suites.
8. Each Suite is cleaned by either one or more Staff. Each Staff cleans one or more Suites.

**Additional Requirements:**

1. Each hotel client refers zero or many hotel Clients.
2. Each hotel client can be referred by at most one client. Not all the hotel clients are referred by a hotel client.
3. Manager Details:
   1. ManagerID – unique identifier
   2. Manager Full Name, composed of First Name and Last Name
   3. Multiple phone numbers
   4. Birth date
   5. Age – derived from the birth date
   6. Salary
   7. Bonus – not all managers have bonus
4. Each manager manages one or more hotels.
5. Each hotel is managed by one manager.
6. Each manager resides in one hotel.
7. A hotel may have at most one manager residing in it.

**Enhanced ERD**

![A diagram of a company

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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Entity** | DB Relation | Primary Key | Other attributes |  |
| hotel | hotel | htID | htAddress, numRooms |  |
| suite (week entity) | suite | htID, sutNumber | sutNumBeds |  |
| hotelClient | hotelClient | hcID | hcFirst, hcLast, hcAddress |  |
| staff | staff | stID | stFirst, stLast |  |
| manager | manager | mgrID | mgrName, mgrLast, bDate, salary, bonus | No need for a column for the Age derived attribute |
| **Multi Value Attribute** | DB Relation | Primary Key | Other attributes |  |
| mgrPhone | mgrPhone | mgrID, Phone Number |  |  |
| **Relationship M:N** | DB Relation | Primary Key | Other attributes |  |
| cleans | cleans | htID, sutNumber, stID |  |  |
| Relationship 1:M |  |  |  |  |
| manages | Add mgrID to the hotel relation (FK) | htID |  |  |
| resides | Add htID to the manager relation (FK) | mgrID |  |  |
| locatedIn (identifying Relationship) | The weak entity already has an FK to the hotel | htID, sutNumber |  |  |
| booking | Add hcID to suite relation (FK) | htID, sutNumber |  |  |
| refers | Add hcID to hotelClient relation (FK) call it referredBy |  |  |  |

* There are 5 entities, 🡪 each require a relation
* One multivalued attribute 🡪 requires a relation
* One many-to-many relationship 🡪 requires a relation
* 5 1:M or 1:1 relationship 🡪 may be implemented as a relation or by including foreign key in the relation for the entity on the many (or 1) side of the relationship
* Total count of: 5 + 1 + 1 + 5 = 12
* Must have at least 2 constraint in the database schema

**Relational Schema**

This section provides the relational schema with referential integrity and relational table details.

**Relational Schema with Referential Integrity**

Hotel(htlID, htlAddress, NoOfRooms, htlManagerID)

foreign key htlManagerID references manager(managerID)

manager(managerID, managerFirstName, managerLastName, managerBirthday,

managerSalary, managerBonus, residenceHotelID)

foreign key residenceHotelID references hotel(htlID)

phoneNumber(managerID, number)

foreign key managerID references manager(managerID)

hotelClient(hcID, hcAddress, hcFirst, hcLast, hcReferenceID)

foreign key hcReferenceID references hotelClient(hcID)

suite(sutNumber, htlID, sutNoOfBeds, bkCheckInDate, bkCheckoutDate, clientID)

foreign key htlID references hotel(htlID)

foreign key clientID references hotelClient(hcID)

staff(stfID, stfFirst, stfLast)

cleans (sutNumber, htlID, stfID)

foreign key sutNumber, htlID references suite(sutNumber, htlID)

foreign key stfID references staff(stfID)

A computer screen shot of a diagram

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