HOTEL MANAGEMENT SYSTEM

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Introduction:

The Hotel Management System was developed to simplify the management of hotel operations, including room availability, customer bookings, and revenue tracking. This system integrates Microsoft Access as a backend database, Microsoft Excel as a front-end interface, and Visual Basic for Applications (VBA) as middleware for automation and dynamic interaction.

Objective

The primary goal of this project was to demonstrate the integration of database management, dynamic front-end interaction, and automation through VBA. The system is built to:

- Manage customer and booking records in an organized database.
- Display real-time room availability and pricing.
- Automate the addition of customer and booking data.
- Analyze revenue data using Pivot Tables.

Technologies used:

- Microsoft Access: Backend database for managing tables and relationships.
- Microsoft Excel: Front-end interface for user interaction and visualization.
- VBA: Middleware for automating tasks such as data import/export and error handling.

Database Design

The database is implemented using Microsoft Access and consists of the following three tables (Fig: 1):

1. Customers Table

- Fields: CustomerID (Primary Key), CustomerName, Contact.
- Purpose: Stores customer details, ensuring unique identification for each customer.

2. Room Table

- Fields: RoomID (Primary Key), RoomType, PricePerNight, IsAvailable.
- Purpose: Stores room details, including type, price, and availability status.

3. Bookings Table

- Fields: BookingID (Primary Key), CustomerID (Foreign Key), RoomID (Foreign Key), CheckInDate, CheckOutDate.
- Purpose: Tracks customer bookings and associates them with specific rooms.

Relationships

- Customers and Bookings: Linked via CustomerID.
- Room and Bookings: Linked via RoomID.

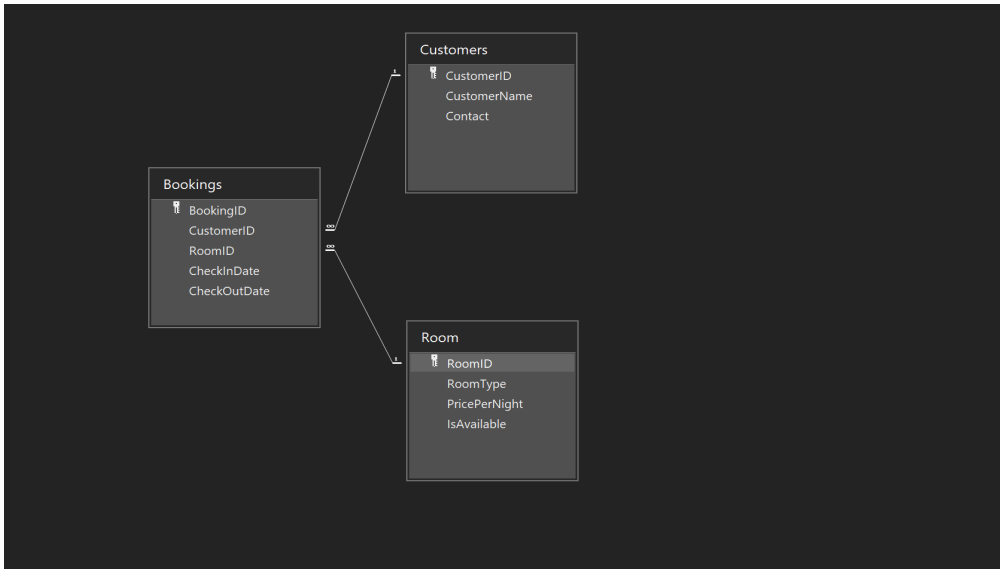


Figure1: Database design and Relations between the tables.

Queries

1. Retreiving Customer Booking

   This query retrieves a particular customers booking based on their CustomerID

```
PARAMETERS [Enter CustomerID] Long;
SELECT Bookings.BookingID, Room.RoomType, Bookings.CheckInDate, Bookings.CheckOutDate
FROM Bookings INNER JOIN Room ON Bookings.RoomID = Room.RoomID
WHERE Bookings.CustomerID = [Enter CustomerID];
```

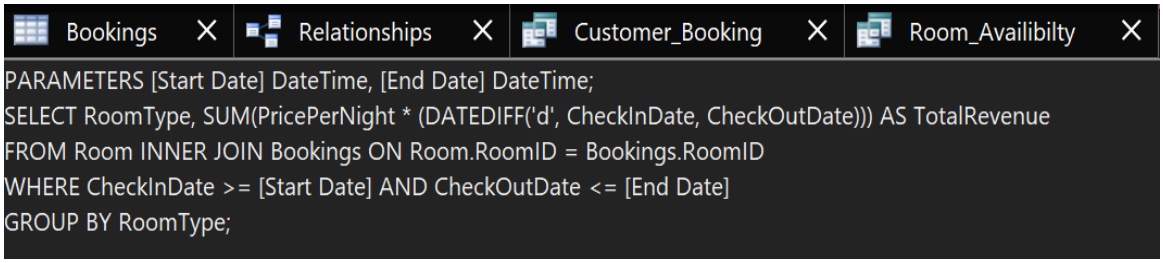
2. Room Avialibility

   The query return the rooms that are currently available on the given day that are possible for booking.

```
SELECT RoomID, RoomType, PricePerNight
FROM Room
WHERE IsAvailable = True;
```

3. Total revenue per room type

The query return the total revenue that has been collected per room type from a given start date to a finish date.



Front End - Excel

The front-end is implemented in Microsoft Excel and consists of three sheets:

1. Booking Overview

- Purpose: Displays real-time room availability data imported from the database.
- Design:
    - Formatted table showing RoomID, RoomType, PricePerNight, and IsAvailable.
    - Includes a "Refresh" button linked to a VBA macro for data updates.

2. Revenue Dashboard

- Purpose: Provides an analysis of total revenue by room type.
- Design:
    - Uses a Pivot Table to summarize and display revenue.
    - Includes a "Refresh Revenue" button linked to a VBA macro for dynamic updates.

3. Booking Form

- Purpose: Allows users to add new customer bookings.
- Design:
    - Input fields for CustomerName, Contact, RoomID, CheckInDate, and CheckOutDate.
    - "Submit" button triggers a VBA macro to validate and insert data into the database.

4. Booking Search

- Purpose: Allows the user to retrieve a booking based on the BookingID or CustomerName
- Design:

    - Input fields for BookingID and CsutomerName
    - “Search” button triggers VBA macro to retrieve the booking if it exists.

VBA

The following VBA subroutines automate the interaction between Excel and Access:

1. ImportRoomAvailability

- Functionality: Fetches room availability data from the database and displays it in the "Booking Overview" sheet.
- Key Features:
    - Clears old data before importing new data.
    - Dynamically adjusts to the current table layout.

2. AddBookingForNewCustomer

- Functionality: Validates and inserts new customer and booking data into the database.
- Key Features:
    - Checks for duplicate customers before adding new ones.
    - Ensures no duplicate bookings exist.
    - If it is a new customer the customer detail is inserted into the customer table and then booking data is added to the booking table.
    - Formats dates to YYYY/MM/DD to avoid mismatches.

3. RefreshRevenuePivot

- Functionality: Refreshes the Pivot Table in the "Revenue Dashboard" sheet to reflect updated revenue data.

4. SearchBooking

- Functionality: Searches for customer bookings based on Booking ID, Customer Name, or both and displays the results in the "Booking Search" sheet.
  Key Features:
    - Allows partial matching for CustomerName using the SQL LIKE operator.
    - Allows exact matching for BookingID.
    - Handles cases where both inputs are provided, ensuring results meet both criteria.
    - Dynamically constructs the SQL query based on provided inputs.
    - Clears previous search results before displaying new data in a formatted table.

Conclusion

The Hotel Management System demonstrates the seamless integration of Microsoft Access, Excel, and VBA to create a simple yet effective solution for hotel operations. While the system is currently designed for a small-scale business, it can be scaled up for real-world use by:

- Expanding the database to include additional entities like staff and inventory.
- Integrating a web-based interface for remote access.
- Adding advanced analytics for customer trends and room usage.