WOLAYITA SODO UNIVERSITY

Collage 0f informatics

Department of computer science

Hotel Management System database project

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To Ms.Feven Teferi

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Introduction

- Hotel is a commercial establishment that provides accommodation, food & beverages, and other recreational facilities like Gym, spa, swimming pool, shopping arcade, etc. We can also define the hotel as a place where the guest is provided with lodging and meal facilities. To avail of these facilities, the guest has to pay the money. The money paid is for the different services that the guest takes. It is an establishment that provides lodging paid on a short-term basis.

The primary function of a hotel is

- To provide lodging accommodations
- A hotel is comprised of several business or revenue centers.
- Hotels exist to provide service and to generate a profit for the owners
- Hotels - exist to serve and enrich society
- Hotels are meant to provide all of the comforts of home to those away from home.

Part I : Project analysis

1. The purpose of hotel management system

to

1. **Save time on admin tasks**

   The right hotel management software will vastly cut down the time you spend on manual administrative tasks. The software does the majority of the work and lets you divert your time to more important tasks, such as serving your guests.

   More than any other software you use, a hotel management system will touch every department at your property. Front of house, revenue management, housekeeping… If you pick the right solution, you can make significant time savings across almost every area of your business, also boosting your staff's productivity and satisfaction.

2. **Develop strong relationships with your guests**

   A more streamlined check-in and check-out experience will boost your guest happiness. And that's only the tip of the iceberg – anything from improved communication and additional services will also heighten guest loyalty. Choosing the best property management software will likely mean an increased level of retention in both guests and staff.

Google values and assesses the user experience on websites, and those that offer a better user journey and interface will rank higher on Google searches – and other search engines.

3. **Implement an effective revenue management system**

Most hotel management systems include pricing tools and other feature to optimize revenue.

Gone are the days of having just a peak season price and a low season price if you're not setting prices in a more sophisticated manner, you're losing out on bookings and not making the most of the guests that do book. You should be able to create and customize product rates, rate dependencies, and special offers and rules such as package rates

4. **Manage distribution functions**

A modern hospitality cloud should be able to easily connect to a channel manager so you can advertise across many channels and easily promote your business across the industry's OTAs and third party booking services.

It provides real-time information that will help you grow your number of reservations and spread awareness of your property.

5. **Accurate daily reports**

Hotel management, finance and revenue teams will have access to accurate daily earnings reports thanks to data-savvy hotel management software.

Meanwhile, operations and marketing reports will help you and your team to make reliable, data-driven decisions across your business.

If everything is in the cloud, these invaluable metrics are at your fingertips whenever you need them, without the need for time-consuming manual exporting and compiling.

6. **Analyze your customer base**

Market and guest segmentation is another important benefit of the right guest management software system. The GM and Marketing Managers can keep track of the different types of visitors, with key demographic breakdowns such as age, gender and nationality

2. objective of hotel management system

- The main objective of the entire activity is to automate the process of day to day activities of Hotel like:

a) Booking rooms
b) Reserving rooms ahead of time.
c) See customer's arrival dates
d) Admission of a New Customer
e) Assign a room according to customer's demand
f) Checkout and check in of a customer
g) Storing employee information
h) Having information on the hotel itself
i) Keeping track of payments

3. Scope of the project

The Hotel Management System provides a system to manage a hotel that has increased in the number of rooms to satisfy the customers need. Without automation the management of the hotel has become an unwieldy task. The end

users' day-to-day jobs of managing a hotel will be simplified by a considerable amount through the automated system. The system will be able to handle many services to take care of all customers in a quick manner. The system should be user appropriate, easy to use, provide easy recovery of errors and have an overall end user high subjective satisfaction. The scope of our project "Hotel Management System" is that it could be given to any small/medium sized hotel so that they can maintain their room booking and reservations, employee details, accounts payable and receivable. In this project, we will keep track of information of employees working in the hotel

4 . System analysis

I. Existing system

The existing systems for hotel management typically rely on a combination of manual processes and basic software solutions that may not fully meet the needs of modern hospitality operations. Here are some key features and limitations of these existing systems:

1. Manual Reservation Management

- Limitations: This method is prone to errors, such as double bookings, and requires significant administrative effort to track reservations and manage room availability.

2. Front Desk Operations

- Limitations: Lack of real-time updates can lead to miscommunication regarding room availability and guest information. Check-in and check-out processes may be slow and cumbersome.

3. Billing and Payments

- Limitations: This can lead to inaccuracies in billing, difficulties in tracking payment methods, and challenges in reconciling accounts. The process may not support multiple payment options effectively.

4. Customer Relationship Management

- Limitations: This results in missed opportunities for personalized marketing and customer engagement. Staff may lack insights into guest preferences and history.

5.. Reporting and Analytics

- Limitations: Generating reports is time-consuming and may not provide real-time insights, hindering effective decision-making.

Conclusion

The existing systems for hotel management often fall short in providing the necessary efficiency, accuracy, and customer-centric features required in today's competitive hospitality landscape. The reliance on manual processes and limited automation can lead to operational inefficiencies, decreased guest satisfaction, and missed revenue opportunities. Transitioning to a more integrated and automated hotel management system can address these limitations, enhancing operational effectiveness and improving the overall guest experience.

II. Proposed system

The proposed Hotel Management System (HMS) is a comprehensive digital solution designed to address the limitations of existing systems by integrating advanced functionalities that streamline operations, enhance user experience, and improve overall efficiency. This system aims to automate key processes within hotel management, providing a robust platform for managing reservations, customer interactions, billing, and reporting.

Key Features of the Proposed System

1. Centralized Reservation Management

Reduces the risk of double bookings, increases staff efficiency, and allows for easy tracking of all reservations.

2. Automated Front Desk Operations

Enhance guest satisfaction through faster service and minimizes administrative workload for front desk staff.

3. Integrated Billing and Payment Processing

Reduces billing errors, improves cash flow management, and provides a seamless payment experience for guests.

4. Customer Relationship Management (CRM)

Enables personalized marketing strategies, enhances guest engagement, and fosters loyalty through targeted promotions.

III. Constraints System

When designing and implementing a hotel management system, it's essential to be aware of potential limitations that may affect its performance, usability, and overall effectiveness. Here are some common limitations to consider:

1. Scalability

- User Load: As the number of users (staff, customers) increases, the system may face challenges in maintaining performance.
- Data Volume: A large volume of bookings, customer data, and transactions can lead to slowdowns if the database is not optimized for scalability

2. User Experience

Real-Time Data Processing
- Booking Conflicts: If the system does not process data in real-time, double bookings may occur, leading to customer dissatisfaction.

3. Limited Functionality

- Customization: Limited ability to customize features may restrict adaptability to specific hotel needs.

4. Cost Implications

- Initial Investment: High upfront costs for software, hardware, and training can be a barrier for smaller hotels.
- Ongoing Costs: Subscription fees, maintenance, and support costs can accumulate over time, impacting the overall budget.

5. Training Requirements

- Staff Training: Staff may require extensive training to use the system effectively, which can be time-consuming and costly.
- Resistance to Change: Employees may resist adopting a new system, leading to inefficiencies during the transition period.

Conclusion

Addressing these limitations during the design and implementation phases can help ensure the hotel management system operates effectively and meets the needs of the hotel and its customers. It's crucial to conduct thorough planning and testing to mitigate these challenges and enhance user experience.

Part Ⅱ :Conceptual Design Phase

- In the conceptual design phase the E-r diagram constructing and documenting takes place.
  To draw the diagram following term must be defined:

1) Entity: it is any object that we held data.
   It is represented by a rectangular shape.
   - Type
     i. **Weak entity:** represented by double rectangle.

ii. **Strong entity:** represented by single rectangle.

2) Attribute: A place of information about entity.
   - Type

Simple Attributes having atomic or indivisible values.

Composite Attributes : having several components in the value.

Derived Attributes: Attribute value is dependent on some other attribute.

Single-valued : having only one value rather than a set of values.

Multi-valued : having a set of values rather than a single value.

Null values: The attribute which are not applicable but the value and key attribute cannot be null.

Default value: Assumed value if not expect value.

3) Relationships: represent the association that exists between entities.
   - Represented by diamond shape.
4) Constraints : Types_ cardinality relationship, participation constraint
   - Represent the constraint in the data

   a) Weak relationship between weak and strong entities.
      - Represented by double diamond shape.

   b) Strong relation is between strong entity.
      - Primary key are underlined.

Identifying Entities and Attributes

We have 6 entity in the database management system. These are:

1. Customer
2. Room
3. Hall
4. Payment
5. Employee
6. Hotel

Entities

- Customer: Represents individuals who use the hotel's services.
- Payment: Represents financial transactions made by customers.
- Employee: Represents individuals working for the hotel.
- Room: Represents individual rooms available in the hotel.
- Hall: Represents halls or event spaces available in the hotel.
- Hotel: Represents the hotel itself, including its branches.

Relationships Between Attributes

1. Customer

* Customer_id: Uniquely identifies each customer.
* C_First_name, C_Last_name: Together form the full name of the customer.
* C_Name: Alternative name of the customer.
* C_address: The address of the customer.
* C_Contact_no: The contact number of the customer.

2. Payment

* payment_id: Uniquely identifies each payment transaction.
* amount: The amount paid in the transaction.
* payment_desc: A description of the payment.
* Payment date: The date of the payment.

3. Employee:

* Employee_id: Uniquely identifies each employee.
* E_First_name, E_Last_name: Together form the full name of the employee.
* E_Name: Alternative name of the employee.

* Address: The address of the employee.
* DoB: The date of birth of the employee.
* Sex: The gender of the employee.
* Education Level: The education level of the employee.
* E_Contact_no: The contact number of the employee.
* Salary: The salary of the employee.

4. Room

* room_no: Uniquely identifies each room.
* R_price: The price of the room.
* R_Status: The status of the room (e.g., available, occupied).
* R_Floor_no: The floor number where the room is located.
* Type: The type of room (e.g., single, double, suite).
* Description: A description of the room.
* Beds: The number of beds in the room.

5. Hall

* Hall_no: Uniquely identifies each hall.
* H_price: The price of the hall.
* H_Status: The status of the hall (e.g., available, booked).
* H_Floor_no: The floor number where the hall is located.

6. Hotel

* Hotel_id: Uniquely identifies each hotel branch.
* Branch name: The name of the hotel branch.
* Location: The location of the hotel branch.

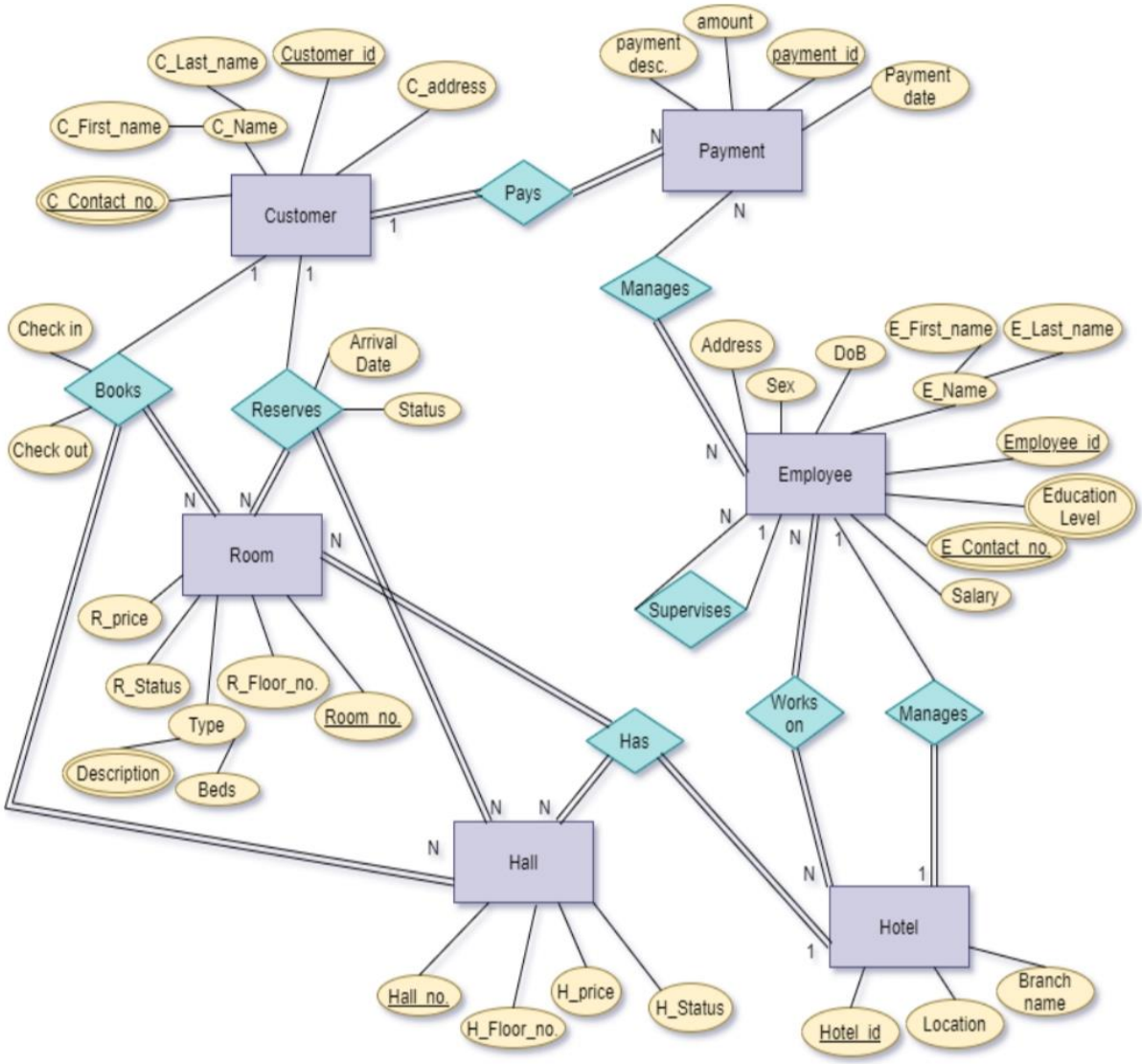
Relationships Between Entities

- Customer - Payment: A customer *pays* for services (one-to-many).
- Customer - Reserves: A customer *reserves* a room (one-to-many).
- Room - Hall: A room *has* a hall (many-to-many).
- Employee - Hotel: An employee *works on* a hotel (many-to-one).
- Employee - Employee: An employee *supervises* other employees (one-to-many).
- Employee - Payment: An employee *manages* payments (one-to-many).
- Employee - Hotel: An employee *manages* a hotel (one-to-many).
- Hotel - Hall: A hotel *has* halls (one-to-many).

Key Points

- Entities: Represent the core objects or concepts in the hotel system.
- Attributes: Describe the characteristics of each entity.
- Relationships: Show how entities are connected to each other.
- Cardinality: The numbers (1, N) on the relationship lines indicate the cardinality (e.g., one-to-many, many-to-ma

ER-DIAGRAM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Payment date
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C_Name
Payment
N
C_Contact_no.
Customer
Pays
1
N
1
1
Manages
Check in
Arrival Date
Address
DoB
E_First_name
E_Last_name
Books
Reserves
Status
Sex
E_Name
Check out
N
Employee
Employee_id
Education Level
N
N
N
1
N
1
E_Contact_no.
Room
N
Salary
Supervises
R_price
R_Status
R_Floor_no.
Type
Room_no.
Works on
Manages
Has
Description
Beds
N
N
N
1
Hall
Hotel
1
Hall_no.
H_Floor_no.
H_price
H_Status
Hotel_id
Location
Branch name

Part Ⅲ : logical Design Phase

1. Mapping and relational schema

In order to change from the ER diagram to relational diagram we need mapping

1. Mapping for employee

Employee

Employee_id	E_first_name	E_last_name	DoB	Sex	Address	Salary

E_contact_no

Employee_id	E_contact_no

Educationa_level

Employee_id	Education_level

2. Mapping for hotel

Hotel

Hotel_id	Location	Branch_name

3. Mapping for hall

Hall

Hall_no	H_floor_no	H_price	H_status

4. Mapping for room

Room

Room_no	R_floor_no	Beds	R_price	R_status

Description

Room_no	Description

5. Mapping for payment

Payment

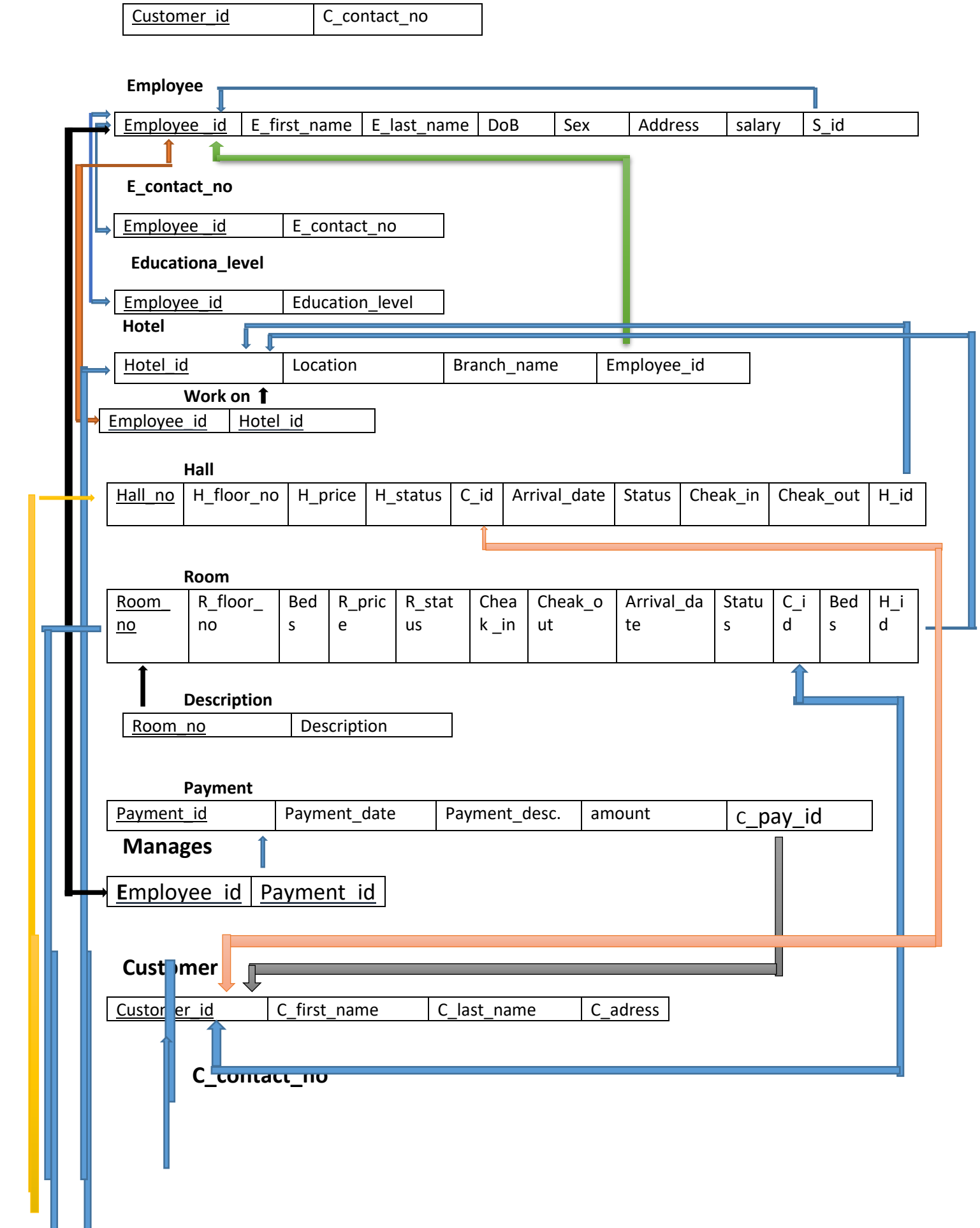
Payment_id	Payment_date	Payment_desc.	amount

6. Mapping for customer

Customer

Customer_id	C_first_name	C_last_name	C_adress

C_contact_no


Customer_id
C_contact_no
Employee
Employee_id
E_first_name
E_last_name
DoB
Sex
Address
salary
S_id
E_contact_no
Employee_id
E_contact_no
Educationa_level
Employee_id
Education_level
Hotel
Hotel_id
Location
Branch_name
Employee_id
Work on
Employee_id
Hotel_id
Hall
Hall_no
H_floor_no
H_price
H_status
C_id
Arrival_date
Status
Cheak_in
Cheak_out
H_id
Room
Room_no
R_floor_no
Beds
R_price
R_status
Cheak_in
Cheak_out
Arrival_date
Status
C_id
Beds
H_id
Description
Room_no
Description
Payment
Payment_id
Payment_date
Payment_desc.
amount
C_pay_id
Manages
Employee_id
Payment_id
Customer
Customer_id
C_first_name
C_last_name
C_adress
C_contact_no

Customer_id	C_contact_no

Has

Room_no	Hall_no	Hotel_id

Books

Room_no	Hall_no	Cheak_in	Ckeak_out

Conclusion

The proposed Hotel Management System aims to streamline hotel operations by automating various processes such as guest management, room booking, and billing. By transitioning from a manual system to a centralized database solution, the hotel can enhance efficiency, reduce errors, and improve customer satisfaction. The design incorporates both functional and non-functional requirements while addressing constraints identified during the analysis phase. With proper implementation and training for staff, the system is expected to significantly improve operational workflows within the hotel.