# PROJECT REPORT

on

# RoomBuddy

# from Analyze Infotech

Towards partial fulfillment of the requirements

for the award of degree of

# **Master of Computer Applications**

from

# Babu Banarasi Das University Lucknow



Academic Session 2023 - 24 School of Computer Applications

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## **UNDERTAKING**

# This is to certify that Project Report entitled RoomBuddy

being submitted by

Abhishek Kumar Pandey & Ashutosh Dubey Towards the partial fulfillment of the requirements

for the award of the degree of

# **Master of Computer Applications**

from

# Babu Banarasi Das University Lucknow



Academic Year 2023-24

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#### TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. Abhishek Kumar Pandey** S/O Mr. Ramshankar Pandey student of MCA from BBD University, Lucknow in recognition of successful completion project of "**Room Rental Services**" on **MERN** at Analyze InfoTech. The duration of his Training was from 01 February 2024 to 15 May 2024.

He has done a good job during his engagement with the software Development & Testing Division of Company. He has completed his project during the Training tenure. His performance was good and satisfactory.

I would like to take this opportunity to express my appreciation to **Mr. Abhishek Kumar Pandey** for his work and wish him All the best for future endeavors.

#### **Yours Sincerely**



Date: 15 May 2024

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(Project Manager)

For Analyze InfoTech, Lucknow.

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**DECLARATION** 

This is to certify that the dissertation entitled **RoomBuddy** is being submitted to the School of

Computer Application, Babu Banarasi Das University, BBD City, Faizabad Road, Lucknow Uttar

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Master of Computer Applications, is a record of Bonafede work carried out by me under the

supervision of Dr. Prabhash Ch. Pathak.

The matter embodied in the dissertation has not been submitted in part or full to any University or

Institution for the award of any other degree or diploma.

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#### **INTRODUCTION**

Room booking is a part of e-commerce. E-commerce or business through net means search room, book room and servicing of products or services over electronic systems such as the Internet and other computer networks. Thus if we own a business we need to upload menu online to attract potential customers. The online room booking system gives booking ability to increase booking and expand their business by giving customers the facility to book room online. With an online book menu ordering system, customers can book room online 24 \*7. Thus it is a simple, fast and convenient room booking system giving an edge over the competition at an affordable price. Internet has seen a tremendous growth in terms of coverage and awareness. So, giving the business an online presence has become very crucial and important. We can set up we room online and the customers can easily book room with a simple mouse click. Also with a book room online we can easily track the facility, maintain customer's database and improve the room facility service. We can receive order through e-mails/ fax or directly view on internet.

RoomBuddy is an essential component of e-commerce, facilitating the search, booking, and servicing of accommodations over electronic systems like the Internet and computer networks. In today's digital age, establishing an online presence for businesses is crucial for reaching potential customers and expanding operations. Online room booking system revolutionizes the way hospitality businesses interact with customers, offering unparalleled convenience and efficiency. This user-friendly platform enables customers to book rooms 24/7 from any device, streamlining the entire booking process with real-time availability updates and instant confirmations. With secure payment options, detailed room descriptions, and flexible booking management, the system enhances guest experience while reducing administrative workload. Integrated notifications, analytics tools, and CRM functionalities further empower businesses to optimize operations, drive revenue, and cultivate lasting guest relationships. Cloud-based scalability ensures adaptability to market demands, making the system a cost-effective solution for businesses seeking a competitive edge in the modern hospitality landscape.

#### Key advantages of an online room booking system include :-

<u>Accessibility:</u> Customers can easily browse available rooms, check prices, and make reservations at anytime from anywhere with an internet connection. This accessibility enhances customer satisfaction and expands the customer base.

**Real-Time Updates:** The system provides real-time availability updates, reducing the risk of overbooking and ensuring accurate reservation information for both customers and staff.

<u>Secure Payment Processing</u>: Integrated secure payment gateways enable customers to make payments online with confidence. Supporting various payment methods enhances convenience and trust in the booking process.

<u>Mobile Compatibility</u>: The system is optimized for mobile devices, allowing customers to book rooms using smartphones or tablets. Mobile compatibility improves user experience and encourages bookings on-the-go.

<u>Automated Notifications</u>: Customers receive automated confirmations and reminders via email or SMS after making a reservation. This feature minimizes no-shows and keeps customers informed throughout the booking process.

<u>Feedback and Reviews</u>: The system facilitates customer feedback and reviews, which are essential for improving service quality and building trust among potential customers.

<u>Integration with Channel Managers</u>: For businesses managing multiple distribution channels, integration with channel managers ensures efficient inventory management and consistent pricing across platforms.

<u>Customizable Booking Rules</u>: Businesses can set customizable booking rules such as minimum stay requirements, seasonal pricing, and promotional offers. This flexibility allows for tailored customer experiences and revenue optimization.

<u>Customer Loyalty Programs</u>: Loyalty programs integrated into the booking system encourage repeat bookings and foster customer loyalty, contributing to long-term business growth.

Incorporating these features into an online room booking system enhances operational efficiency, improves customer satisfaction, and drives business growth in the competitive hospitality industry. With the widespread adoption of internet services, leveraging an online booking platform is essential for staying relevant and maximizing revenue potential. Moreover, the integration of secure payment gateways ensures that customers can make transactions with confidence, supported by various payment methods that enhance convenience and trust in the booking process. The system's mobile compatibility further extends its accessibility, allowing customers to book rooms easily using smartphones or tablets, thereby improving user experience and encouraging bookings on-the-go. Automated notifications, such as confirmations and reminders, play a crucial role in minimizing noshows and keeping customers informed throughout the booking process, enhancing overall engagement and satisfaction.

Furthermore, the system facilitates customer feedback and reviews, enabling businesses to continuously improve service quality and build trust among potential customers. Integration with channel managers ensures efficient inventory management and consistent pricing across multiple platforms, maximizing distribution channels and optimizing revenue streams. Customizable booking rules, including minimum stay requirements and seasonal pricing, enable businesses to tailor experiences to customer preferences, ultimately driving revenue optimization and enhancing customer loyalty. Beyond operational benefits, the online room booking system contributes to strategic decision-making by centralizing guest information and reservation details, providing valuable insights for optimizing services and marketing strategies. The system's scalability and adaptability, facilitated by cloud-based architecture, enable businesses to expand operations seamlessly and respond dynamically to market trends and seasonal fluctuations. Ultimately, embracing digital transformation through an online booking platform provides businesses with a competitive advantage by delivering innovative features, enhancing guest experiences, and driving sustainable growth in today's dynamic hospitality industry.

#### **PROBLEM DEFINITION**

At present there are many online room booking systems that maintain their day-to-day transactions manually. These have a number of consumers, staff as a result they need to track of all these clients requirements. At this point **RoomBuddy** will play an important role in helping the admin to perform all these operation on a single click. This project will handle all the necessary data as well as every minute details of the campus and properly.

The hospitality industry faces several challenges related to traditional room booking processes, which can be addressed by implementing an online room booking system:

- Limited Accessibility and Availability: Many hotels and accommodations rely on manual booking systems or phone reservations, limiting accessibility for customers who prefer online booking. This leads to missed booking opportunities and potential revenue loss.
- Risk of Overbooking and Manual Errors: Manual booking processes are prone to
  errors, including overbooking due to outdated availability information. This can result in
  guest dissatisfaction and operational disruptions.
- Security and Payment Concerns: Handling payment information manually or through insecure methods raises security concerns for both guests and businesses. Lack of secure payment gateways can deter customers from making online bookings.
- Inefficient Booking Management: Traditional booking methods require significant
  administrative effort to manage reservations, update availability, and handle customer
  inquiries. This inefficiency can hinder overall operational productivity.

- Limited Customer Engagement and Feedback: Without a centralized platform for customer interactions, hotels struggle to engage with guests effectively and gather valuable feedback to improve services and enhance guest experiences.
- Complex Inventory and Pricing Management: Managing room inventory across multiple distribution channels and adapting pricing strategies to market demands is challenging without automated tools, resulting in missed revenue opportunities.
- Lack of Data-Driven Insights: Traditional booking systems lack robust analytics capabilities, making it difficult for businesses to analyze booking trends, guest preferences, and performance metrics to inform strategic decision-making.
- Inability to Scale and Adapt :- Legacy systems may lack scalability, making it challenging for businesses to expand operations or respond quickly to changing market conditions and customer expectations.

The implementation of an online room booking system aims to address these challenges by providing a user-friendly, secure, and scalable platform that enhances accessibility, automates booking processes, facilitates secure payments, fosters customer engagement, optimizes inventory management, and empowers data-driven decision-making. By embracing digital transformation through an online booking solution, businesses can streamline operations, improve guest experiences, and drive sustainable growth in the competitive hospitality industry.

### **OBJECTIVE**

The present-day world heavily relies on computers due to their efficiency in handling vast amounts of data and information. Manual record-keeping processes are often cumbersome and inefficient, making it challenging to manage and retrieve data promptly, especially in urgent situations. Therefore, developing a software solution aimed at automating and organizing record-keeping tasks is crucial for enhancing operational efficiency and data management in various industries, including restaurants and hospitality. The primary objective of this project is to develop a comprehensive software system that facilitates efficient data storage, maintenance, and retrieval specifically tailored for restaurant operations. This software will replace manual record-keeping methods, enabling organizations to manage their records systematically and effectively.

Key objectives of the software development project include -

- Record Management: The software will enable the storage and management of various records, including customer details, staff information, and service-related data. Authorized personnel will have the ability to access, modify, and delete records as necessary, ensuring data integrity and confidentiality.
- Manpower Optimization: By automating manual tasks, the software aims to reduce dependency on human resources for record-keeping, allowing staff to focus on more valueadded activities within the restaurant.
- Enhanced Processing Speed: The software will streamline data processing and transactional workflows, enabling faster and more efficient operations compared to manual methods.
- Security Features: Implementation of robust security measures, such as password
  protection and access controls, will safeguard sensitive data and ensure compliance with
  privacy regulations.
- User-Friendly Interface: The software will prioritize usability, featuring an intuitive and user-friendly interface that minimizes the need for extensive user training. This approach will enhance adoption and productivity among restaurant staff.

• Customization and Scalability: - The software will be designed to accommodate the unique needs and requirements of different restaurants, offering customization options and scalability to support business growth and evolving operational demands.

By addressing these objectives, the software solution aims to revolutionize record-keeping practices within the restaurant industry, leading to improved efficiency, data security, and overall organizational productivity. The adoption of such technology not only modernizes restaurant operations but also contributes to enhanced customer service and competitiveness in a digitally-driven marketplace.

The system objectives highlight the critical role of computers in modern work environments, emphasizing the challenges associated with manual data management and the need for efficient information handling. A ROOM BOOKING SYSTEM is designed to address these challenges by leveraging technology to streamline the process of room reservations and management. It serves as a vital tool in today's digital era, enhancing accessibility and improving organizational efficiency.

#### **System Context:-**

The **RoomBuddy** operates within a defined environment that includes various entities and interactions:

- **Users:** Customers and administrators interact directly with the system to search for available rooms, make bookings, and manage reservations.
- External Systems: The system may interface with external services such as payment gateways for secure transactions and channel managers for inventory synchronization.
- **Database:** The system interacts with a database to store and retrieve information related to room availability, customer bookings, and administrative data.
- **Hardware Components:** The system may be hosted on servers and accessed through various devices, including desktop computers, laptops, tablets, and smartphones.

The **RoomBuddy** functions autonomously to facilitate room bookings and management tasks, ensuring seamless interactions with users and other external entities while maintaining data integrity and security.

#### **Functional Requirements:-**

This room booking system must fulfill specific functional requirements to meet user needs and ensure system effectiveness:

- User Authentication: The system must authenticate users through a username and
  password before granting access to booking functionalities, ensuring data security and user
  privacy.
- Room Booking: Users should be able to search for available rooms, view details, select desired dates, and make bookings efficiently through the system.
- Administrative Controls: Authorized administrators should have secured access to input and manage product data, including room types, pricing, and availability.
- Non-Functional Requirements: -

**RoomBuddy** must also adhere to non-functional requirements to optimize user experience and system performance:

- User-Friendly Interface: Input errors should be visually highlighted, providing clear feedback to users through appropriate error messages, enhancing usability and reducing user frustration.
- **Real-Time Updates**:- The system should automatically update after every transaction, reflecting changes instantly in room availability and reservation status.
- **Data Security:** The system must ensure data security and confidentiality, especially for user credentials and payment information, leveraging encryption and secure protocols.

#### **REQUIREMENTS SPECIFICATIONS**

#### **Hardware Requirements:-**

- Processor: The system requires a Pentium IV processor or equivalent, providing sufficient processing power to handle the operations of the room booking application efficiently.
- **Memory (RAM)**:- A minimum of 512 MB RAM is recommended to ensure smooth performance, particularly when managing multiple tasks and handling database operations.
- Storage (HDD):- A minimum of 40 GB of hard disk space is necessary to install the software and accommodate data storage, including room information, customer records, and application files.
- **Display :-** A color monitor capable of displaying graphics and text clearly is essential for users to interact with the application and view room availability, booking details, and administrative functions.
- **Input Devices :-** Standard input devices such as a keyboard and mouse are required for user interaction, enabling navigation, data entry, and selection within the application.

#### Software Requirements:-

Node.js: The backend of the MERN application will be built using Node.js, a JavaScript
runtime environment. Install the latest version of Node.js to run the backend server and
manage dependencies.

- MongoDB: Use MongoDB as the database management system (DBMS) for storing and
  managing application data. Install MongoDB and ensure it is running to enable data
  persistence for the MERN stack application.
- React.js: Develop the frontend of the application using React.js, a popular JavaScript library for building user interfaces. Use Create React App or a similar tool to bootstrap the React project.
- Express.js: Use Express.js as the backend web application framework for Node.js to handle HTTP requests, routing, middleware, and API integration within the MERN stack application.
- Text Editor (e.g., Visual Studio Code):- Use a code editor such as Visual Studio Code, Atom, or Sublime Text for writing, editing, and managing code files. Ensure the editor supports JavaScript and React syntax highlighting and provides useful development tools.
- Package Manager (e.g., npm or Yarn): Use npm (Node Package Manager) or Yarn as
  the package manager for installing dependencies, managing project configurations, and
  running scripts related to the MERN stack application.

Hardware and the software play a major role in the development cycle of any system, right from the planning phase to the end of the development process and then in the implementation of the system. The Hardware and the software requirements are the key factors during the feasibility of the candidate system.

## Software requirements:

Sno.	Name	Description	
1	OS	Windows 10,11	
	P P 1	DE A OH	
3	Front End	REACT	
4	Front End Editor	NODEJS	
5	Back End	MONGODB	
6	For Documentation	MS Office 2015	

## Hardware requirements:

Sno.	Name	Version
1	Processor	Dual Core
2	RAM	512MB
3	HDD	128GB

#### **MODULE DISCRIPTION**

#### USER: -

**RoomBuddy** offers a seamless login experience for users, facilitating easy access to essential features and functionalities:

Upon accessing the login page, users input their credentials, including a unique USER NAME and PASSWORD. The system initiates an authentication process by cross-referencing these details with the existing database records. Upon successful verification, users gain access to the main dashboard, where they can perform the following actions:

- Book Rooms: Users can effortlessly browse available rooms, check availability based on desired dates, and make reservations with convenience and flexibility.
- View Booked Rooms: Users can review their booked rooms, accessing details such as reservation dates, room types, and any additional services requested.
- **Update Profile:** Users can easily update their profile information, including contact details and personal preferences, ensuring accuracy and relevance.
- Receive Notifications: The system sends automated notifications for booking confirmations, reminders, and exclusive offers, keeping users informed and engaged.

In cases where authentication fails due to invalid credentials, the system prompts users with a clear warning message to re-enter the correct USER NAME and PASSWORD combination.

#### **HOTEL OWNERS: -**

Hotel owners play a pivotal role in the **RoomBuddy** ecosystem, leveraging specific functionalities tailored to their property management needs:

Using the same login/signup interface as users, hotel owners can access dedicated features to list and manage their properties:

- List Hotels: Owners can seamlessly add their properties to the platform, providing comprehensive details such as room types, amenities, location, gallery images, and additional services like parking and dining facilities.
- Manage Hotel Profile: Owners have full control to update and maintain their hotel profiles, ensuring accurate and up-to-date information is showcased to potential guests.
- **Review Bookings :-** Hotel owners can efficiently monitor and manage incoming room reservations, update availability in real-time, and respond promptly to booking requests.
- Interact with Guests: Owners can directly communicate with guests through the platform, addressing inquiries, providing assistance, and delivering personalized guest experiences.

The intuitive interface provided by the room booking system empowers hotel owners to handle all aspects of property listing and guest interactions efficiently.

#### **SUPER ADMIN: -**

The Super Admin role holds supreme authority and oversight over the entire RoomBuddy system, ensuring smooth operations and maintaining system integrity:

#### Key responsibilities of the Super Admin include:

• Manage User Accounts: Overseeing user registrations, account approvals, and addressing user-related inquiries and issues.

- Approve Hotel Listings: Reviewing and approving hotel owners' requests to list their properties on the platform, ensuring compliance with system standards and guidelines.
- Monitor System Performance :- Regularly monitoring system performance, resolving technical issues promptly, and ensuring data security and confidentiality.
- Implement System Updates :- Leading the implementation of system updates, enhancements, and new features to optimize user experience and operational efficiency.
- Handle Exceptional Cases: Intervening in exceptional cases, such as resolving disputes, handling escalated support issues, and maintaining overall system stability.

The Super Admin's role is instrumental in upholding the credibility, effectiveness, and security of the **RoomBuddy** platform, ensuring a seamless experience for users, hotel owners, and all stakeholders involved in the room booking process. This strategic approach fosters transparency, efficiency, and user satisfaction, contributing to the platform's success and growth within the competitive hospitality industry.

#### **FEASIBILITY STUDY**

All projects are feasible given unlimited resources and infinite time! Unfortunately, the development of computer-based system is more likely to be plagued by a scarcity of resources. It is both necessary and prudent to evaluate the feasibility of the project at the earliest possible time. Months or years of effort, Money loss and untold professional embarrassment can be averted I few better understand the project at its study time.

This type of study determines if an application can and should be developed. Once it has been determining that, application is feasible. After that analyst can go ahead and prepares the project specification, which finalizes project requirements. Feasibility studies are undertaken within tight time constraints.

- Technical Feasibility
- Operational Feasibility
- Economic Feasibility
- Legal Feasibility

#### • Technical Feasibility:-

As we know the technical feasibility is concerned with specifying equipment and software that will successfully satisfy the user requirement. The technical needs of the system may vary considerably, but might include:

- The facility to produce outputs of advertisements, booking and mailing in each time for ease of use.
- Response time under certain condition is minimal.
- Ability to process a certain volume of transaction at a particular speed.
- Facility to communicate data to distinct location.
- In examining the technical feasibility, configuration of the system is given more importance than the actual make of hardware. The configuration should give the

complete picture about the system's requirements- how many workstations are required, how these units are interconnected so that they could operate and communicate smoothly.

#### • Operational Feasibility:-

Proposed projects are beneficial only if they can be turned into information system that will meet the financial management requirements of the business/organization. This test of feasibility asks if the system will work when it developed and installed. Are there major barriers to implementation?

Some of the important questions that are useful to test the operational feasibility of a project are given below:

- Is there sufficient support for the project from the implementation? From user? If the present system is well liked and used to the extent that persons will not be able to see reasons for change, there may be resistance.
- Are current business methods acceptable to the user? If they are not, user may welcome a change that will bring about a more operational and useful system.
- Has the user been involved in the planning and development of the Project? If they are involved at the earliest stage of project development, the chances of resistance can be possibly reduced.
- Will the proposed system cause harm? Will it produce poorer result in any case or area?
- Will the performance of staff members fall down after implementation?
- Issue that appears to be quite minor at the early stage can grow into major problem after Implementation.

#### • Economic Feasibility:-

Economic analysis is the most frequently used technique for evaluating the effectiveness of the proposed system. More commonly known as cost/benefits analysis, the procedure is to determine the benefits and savings that are expected from the purposed system and compared with costs. If benefits outweigh cost, a decision is taken to design and implement the system. Otherwise, further justification or alternative of the proposed system will have to be made if it has a chance of being approved. This is an ongoing effort that improves in accuracy at each phase of the system life cycle.

The analysis part also clears the doubt of economic problems which could be possible in developing the system. As already mentioned, that the company must just pay the developed software cost and no other investment is needed at the time of implementation of the new system as the preliminary requirements already exist in the company.

#### <u>Legal Feasibility:-</u>

Legal feasibility is a critical aspect of the feasibility study for software development projects, ensuring that the proposed system complies with applicable laws, regulations, and ethical standards. This assessment is essential to validate the legality and permissibility of implementing specific features, functionalities, and data handling practices within the software. The goal is to identify any potential legal risks or constraints that could impact the development, deployment, and operation of the software system.

#### **PROBLEM SPECIFICATION**

The definition of our problem lies in manual system and a fully automated system.

#### Manual System: -

The system is very time-consuming and lazy. This system is more prone to error and sometimes the approach to various problems is unstructured.

#### Technical System: -

With the advent of the latest technology if we do not update our system then our business result in losses gradually with time. The technical system contains the tools of latest trend i.e. computers, printers, FAX, Internet etc. the system with the technology are very fast, accurate, user friendly and reliable.

#### Need of room booking System :-

**RoomBuddy** is very needy for various rooms. This website helps them maintain day to day entries of the customers who are their client or those who desire to be, daily bases booking of the rooms in computer.

#### The Proposed System :-

The proposed system helps them in many ways. It helps them do billing very easily. Account maintenance also becomes easier. They can keep track of their sales, stocks of the supplements and account details of their customers regarding their packages and many more. The software is provided with all the master entries to enter any new product, or customer or trainer to add or modify and delete.

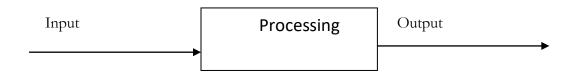
#### **Existing System: -**

At present various Room booking systems maintain their day-to-day transactions manually. These have thousands of products they need to track of all these products to check the stock, order date etc. To find the product is also another risky job and this also applies for in finding the details of the customer. So proper system is required. They need full pledged software to maintain their day-to-day transactions.

#### SYSTEM ARCHETECTURE DESIGN

#### • DEFINING A SYSTEM: -

Collection of components, which are interconnected, and work together to realize some objective, from a system. There are three components in every system, namely input, processing and output



#### **System Development Life Cycle:**

The System development life cycle (SDLC), or Software development process in systems engineering, information systems and software engineering, is a process of creating or altering information systems, and the models and methodologies that people use to develop these systems. In software engineering, the SDLC concept underpins many kinds of software development methodologies. These methodologies form the framework for planning and controlling the creation of an information system the software development process.

Broadly, following are the different activities to be considered while defining the system development life cycle for the said project:

- Problem Definition
- System Analysis
- Study of existing system
- Drawback of the existing system
- Proposed system
- System Requirement study

- Data flow analysis
- Feasibility study
- System design
- Input Design (Database & Forms)
- Updating
- Query /Report design
- Administration
- Testing
- Implementation
- Maintenance

#### • SYSTEM ANALYSIS :-

**Systems analysis** is the study of sets of <u>interacting entities</u>, including computer systems analysis. This field is closely related to <u>requirements analysis</u> or <u>operations research</u>. It is also "an explicit formal inquiry carried out to help someone (referred to as the decision maker) identify a better course of action and make a better decision than he might otherwise have made.

System development can generally be thought of having two major components: systems analysis and systems design. In System Analysis more emphasis is given to understanding the details of an existing system or a proposed one and then deciding whether the proposed system is desirable or not and whether the existing system needs improvements. Thus, system analysis is the process of investigating a system, identifying problems, and using the information to recommend improvement to the system.

#### SYSTEM DESIGN :-

Systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. One could see it as the application of systems theory to product development. There is some overlap with the disciplines of systems analysis, systems architecture and systems engineering. If the broader topic of product development "blends

the perspective of marketing, design, and manufacturing into a single approach to product development," then design is the act of taking the marketing information and creating the design of the product to be manufactured. Systems design is therefore the process of defining and developing systems to satisfy specified requirements of the user. Until the 1990s systems design had a crucial and respected role in the data processing industry. In the 1990s standardization of hardware and software resulted in the ability to build modular systems. The increasing importance of software running on generic platforms has enhanced the discipline of software engineering.

Object-oriented analysis and design methods are becoming the most widely used methods for computer systems design. The UML has become the standard language in object-oriented analysis and design. It is widely used for modeling software systems and is increasingly used for high designing non-software systems and organizations

#### ENTITY RELATION DIAGRAM

The Entity Relation Model or Entity Relation Diagram (ERD) is a data model or diagram for high-level description of conceptual data model, and it provides a graphical notation for representing such data models in the form of entity relationship diagrams. Such models are typically used in the first stage of Management information system design; they are used for example, to describe information needs and/ or the type of information that is to be stored in the Database during the requirement analysis. The data modeling technique, however, can be used to describe any ontology (i.e. an overview and classification of used term and their relationships) for a certain universe of discourse (i.e. area of interest).

In the case of design a Management Information System that is based on a database, the conceptual data model is, a later stage( usually called logical design), mapped to a logical data model such as, relational data model; this is turn in mapped to a physical model during physical design. Note that sometimes, both of the phases are referred a "physical design". There are number of convention for entity-relation diagrams (ERDs). The classical notation is describe in the remainder of this article, and mainly related to the conceptual modeling. There is a range of notation more typically employed in physical and logical database design.

An Entity-Relationship (ER) diagram for a room booking website with three modules (User, Hotel Owners, and Super Admin) can be designed to illustrate the relationships and data structure of the system. Below is an explanation of the main entities, their attributes, and the relationships between them:

#### **Entities and Attributes:**

- User
  - Attributes:
    - o UserID (Primary Key)
    - o Name

- o Email
- o Password
- o Phone
- o Address

#### HotelOwner

- Attributes:
  - o OwnerID (Primary Key)
  - o Name
  - o Email
  - Password
  - o Phone
  - o HotelList

#### Booking

- Attributes:
  - o BookingID (Primary Key)
  - o UserID (Foreign Key)
  - o RoomID (Foreign Key)
  - o CheckInDate
  - o CheckOutDate
  - o TotalPrice
  - o BookingStatus

#### Relationships:

<u>User-Booking Relationship:</u> - A user can have multiple bookings, but each booking is linked to only one user.

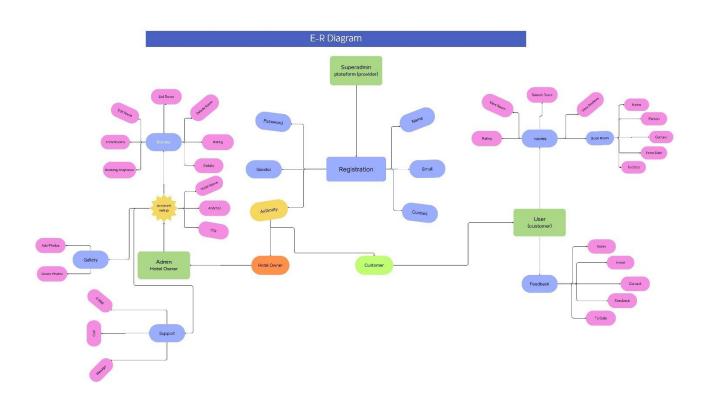
<u>Hotel Relationship:</u> A hotel owner can own multiple hotels, but each hotel is linked to only one owner.

<u>Hotel-Room Relationship:</u> - A hotel can have multiple rooms, but each room belongs to only one hotel.

Room-Booking Relationship: - A room can be booked multiple times by different users at different times.

<u>Super Admin: -</u> The super admin has oversight and management capabilities over both users and hotel owners.

Here is the ER diagram of RoomBuddy below -



ER Diagram of RoomBuddy

#### **DATA FLOW DIAGRAM: -**

The data flow diagram shows the flow of data within any system. It is an important tool for designing phase of software engineering. Larry Constantine first developed it. It represents graphical view of flow of data. It's also known as BUBBLE CHART. The purpose of DFD is major transformation that will become in system design symbols used in DFD.

In the DFD, four symbols are used and they are as follows.

1. A square defines a source (originator) or destination of system data.



2. An arrow identifies data flow-data in motion. It is 2a pipeline through which information flows.

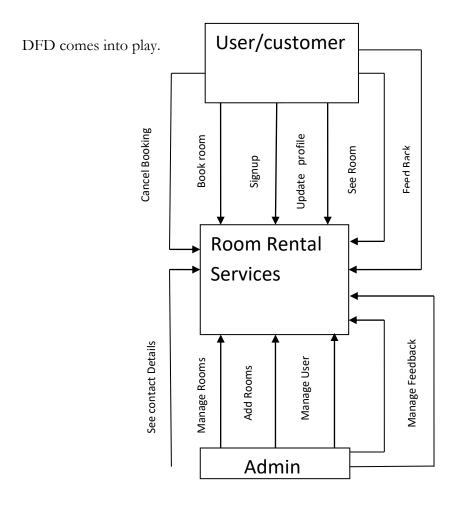


3. An open rectangle is a data store-data at rest, or a temporary Repository of data.



#### **CONTEXT LEVEL DATA FLOW DIAGRAM:**

This level shows the overall context of the system and its operating environment and shows the whole system as just one process. Online book store is shown as one process in the context diagram; which is also known as zero level DFD, shown below. The context diagram plays important role in understanding the system and determining the boundaries. The main process can be broken into sub-processes and system can be studied with more detail; this is where 1<sup>st</sup> level



Zero Level Data Flow Diagram

# PROJECT PLANNING & PROJECT SCHEDULING

## **GANTT CHART: -**

Task	Task	Feb	Feb	March	March	March	April	May
No.								
1	Requirement							
	Analysis							
2	Design							
3	Coding							
4	Testing							
5	Documentation							
6	Implementation							
7	Final Review							

# **DATABASE COLLECTION**

### 1. Admin and User Login: -

S.NO.	Fields	Data type
1	Username	String
<u>2</u>	Password	String
<u>3</u>	Email	String

### 2. <u>User Signup: -</u>

<u>S.NO.</u>	Fields	Data type
1	username	String
<u>2</u>	email	String
<u>3</u>	first_name	String
<u>4</u>	last_name	String
<u>5</u>	Mobile	String
<u>6</u>	gender	String
7	Dob	String
<u>8</u>	address	String
9	image	String

#### 3. Feedback: -

<u>S.NO.</u>	Fields	Data type
1	feedback_name	String
<u>2</u>	feedback_contact	String

3	feedback_email	String
<u>4</u>	feedback_comment	String

# 4. Room Detail Table: -

S.NO.	Fields	Data type
1	room_no	String
<u>2</u>	price	String
<u>3</u>	Туре	String
4	Status	String
<u>5</u>	Image	String

#### **COLLECTION DESCRIPTION: -**

#### 1. Users Collection:

Stores information about users who book rooms.

#### Attributes:

- o UserID: Unique identifier for the user (Primary Key).
- o Name: Full name of the user.
- o Email: Email address of the user (Unique).
- o Password: Encrypted password.
- O Phone: Contact number.
- o Address: Residential address.
- o BookingHistory: Array of BookingIDs referencing the Bookings collection.

#### 2. HotelOwners Collection:

Stores information about hotel owners.

#### Attributes:

- o OwnerID: Unique identifier for the hotel owner (Primary Key).
- Name: Full name of the owner.
- o Email: Email address of the owner (Unique).
- Password: Encrypted password.
- o Phone: Contact number.
- o HotelList: Array of HotelIDs referencing the Hotels collection.

# 3. SuperAdmins Collection:

Stores information about super administrators who manage the platform.

#### Attributes:

- o AdminID: Unique identifier for the super admin (Primary Key).
- O Name: Full name of the admin.
- o Email: Email address of the admin (Unique).
- o Password: Encrypted password.
- o Phone: Contact number.

### 4. Hotels Collection:

Stores information about hotels owned by hotel owners.

#### Attributes:

- o HotelID: Unique identifier for the hotel (Primary Key).
- OwnerID: Foreign key referencing HotelOwners.OwnerID.
- o Name: Name of the hotel.
- o Location: Address or location of the hotel.
- o Description: Description of the hotel.
- o Rating: Average rating based on user reviews.
- o RoomList: Array of RoomIDs referencing the Rooms collection.

### 5. Rooms Collection:

Stores information about individual rooms in hotels.

#### Attributes:

- o RoomID: Unique identifier for the room (Primary Key).
- o HotelID: Foreign key referencing Hotels.HotelID.
- o RoomType: Type of the room (e.g., single, double, suite).
- o Price: Price per night.
- o Availability: Boolean indicating if the room is available for booking.
- o Amenities: List of amenities provided in the room.

# 6. Bookings Collection:

Stores information about room bookings made by users.

- o Attributes:
- o BookingID: Unique identifier for the booking (Primary Key).
- o UserID: Foreign key referencing Users.UserID.
- o RoomID: Foreign key referencing Rooms.RoomID.
- o CheckInDate: Date of check-in.
- o CheckOutDate: Date of check-out.
- o TotalPrice: Total cost of the booking.
- o BookingStatus: Status of the booking (e.g., confirmed, canceled).

### **TESTING**

Testing in RoomBuddy is a major quality control measure used during software development. Its basic function is to detect errors in RoomBuddy project software. Testing not only uncovers errors introduced during coding, but also errors introduced during RoomBuddy project previous phases. Thus, the RoomBuddy project goal of RoomBuddy project testing is to uncover requirements, design and coding errors in RoomBuddy project programs. RoomBuddy project for different levels of testing is used. Testing is an extremely critical and time-consuming activity. It requires proper planning of the RoomBuddy project overall testing process. RoomBuddy project output of RoomBuddy project testing phase is RoomBuddy project test report and RoomBuddy project error report. The test report contains RoomBuddy project set of test cases and RoomBuddy project result of executing RoomBuddy project code with RoomBuddy project test cases. RoomBuddy project error report describes RoomBuddy project errors encountered and RoomBuddy project action taken to remove RoomBuddy project errors.

#### **Implementation: -**

It is RoomBuddy project process of having systems personnel check out and put new equipment into use, train users, install RoomBuddy project new application and construct any files of data needed to use it. This phase is less creative than system design. Depending on RoomBuddy project size of RoomBuddy project organization that will be involved in using RoomBuddy project application and RoomBuddy project risk involved in its use, systems developers may choose to test RoomBuddy project operation in only one area of RoomBuddy project firm with only one or two persons. Sometimes, RoomBuddy projects will run both old and new systems in parallel way to compare RoomBuddy project results.

#### Paradigm Applied: -

In this project, the RoomBuddy project <u>Spiral Model</u> is applied to provide rigid efficiency and functionality in RoomBuddy project overall working style of RoomBuddy project. Moreover, to cater to new or modified requirements of RoomBuddy project user, Spiral model is very effective. I used "RoomBuddy project Spiral model" as it is best suited to those development

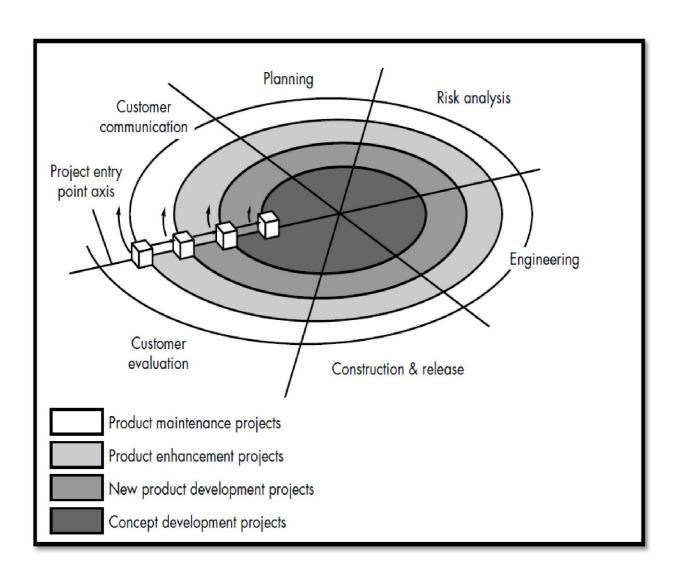
environments where probability of uncertainty is very high, and chances of mistakes are uncontrollable.

#### The Spiral Model: -

The spiral model, originally proposed by Boehm, is an evolutionary software process model that couples the iterative nature of prototyping with the controlled and systematic aspects of the linear sequential model. It provides the potential for rapid development of incremental versions of the software. Using the spiral model, software is developed in a series of incremental releases. During early iterations, the incremental release might be a paper model or prototype. During later iterations, increasingly more complete versions of the engineered system are produced. A spiral model is divided into several framework activities, also called task regions.6 typically, there are between three and six task regions. Figure depicts a spiral model that contains six task regions:

- Customer communication—tasks required to establish effective communication between developer and customer.
- Planning—tasks required to define resources, timelines, and other project related information.
- Risk analysis—tasks required to assess both technical and management risks.
- Engineering—tasks required to build one or more representations of the application.
- **Construction and release**—tasks required to construct, test, install, and provide user support (e.g., documentation and training).
- Customer evaluation—tasks required to obtain customer feedback based on evaluation of the software representations created during the engineering stage and implemented during the installation stage. Each of the regions is populated by a set of work tasks, called a task set, that are adapted to the characteristics of the project to be undertaken. For small projects, the number of work tasks and their formality is low. For larger, more critical projects, each task region

contains more work tasks that are defined to achieve a higher level of formality. In all cases, the umbrella activities (e.g., software configuration management and software quality assurance) noted are applied. As this evolutionary process begins, the software engineering team moves around the spiral in a clockwise direction, beginning at the center. The first circuit around the spiral might result in the development of a product specification; subsequent passes around the spiral might be used to develop a prototype and then progressively more sophisticated versions of the software. Each pass through the planning region results in adjustments to the project plan. Cost and schedule are adjusted based on feedback derived from customer evaluation. In addition, the project manager adjusts the planned number of iterations required to complete the software. Unlike classical process models that end when software is delivered, the spiral model can be adapted to apply throughout the life of the computer software. An alternative view of the spiral model can be considered by examining the project entry point axis, also shown in Figure. Each cube placed along the axis can be used to represent the starting point for different types of projects.



## **FUTURE SCOPE OF THE PROJECT**

The proposed system helps them in many ways. It helps them do billing very easily. Account maintenance also becomes easier. They can keep track of their purchases, sales, stocks and account details. The website is provided with all the master entries to enter any new product, or supplier, or to add or modify and delete. As this is generic software it can be used by a wide variety of outlets (Retailers and Wholesalers) to automate the process of manually maintaining the records related to the subject of maintaining the stock and cash flows. In future it can be modify, so that it can be done online. To make this facility this is the major change which can be made in future regarding this project.

Here are some potential areas for future development:

## 1. Advanced Technology Integration

#### Artificial Intelligence (AI) and Machine Learning (ML):

- Implement AI-driven recommendation systems to suggest rooms based on user preferences and past behavior.
- Use ML algorithms to optimize dynamic pricing models and predict booking trends.
- o Internet of Things (IoT):
- O Integrate smart devices for room control, allowing users to adjust room settings (lights, temperature) via the booking platform.
- Provide real-time updates on room status and availability through IoT sensors.

## 2. Enhanced User Experience:

#### Personalization:

- Develop more personalized booking experiences by analyzing user data to tailor recommendations, offers, and communication.
- Offer customizable room setups and packages based on user preferences and special occasions.
- Multilingual Support:

o Expand language support to cater to a global audience, making the platform accessible to non-English speaking users.

## 3. Expanding Services and Offerings:

### • Activity and Experience Booking:

- Integrate the booking of local tours, activities, and dining experiences directly within the platform.
- o Partner with local businesses to offer exclusive deals and packages to users.
- o Transportation Integration:
- Provide options to book transportation services such as airport transfers, car rentals, and public transport passes.

## 4. Improved Security and Privacy:

#### Enhanced Security Measures:

- Implement stronger authentication methods such as biometrics and two-factor authentication.
- o Continuously update security protocols to protect user data against emerging threats.

#### Data Privacy:

- Ensure compliance with international data protection regulations (e.g., GDPR, CCPA).
- Provide users with greater control over their data, including options to view, edit, and delete their information.

# 5. Robust Analytics and Insights:

#### Advanced Analytics for Hotel Owners:

 Offer detailed analytics dashboards for hotel owners to track performance metrics, customer demographics, and booking trends.  Provide insights and recommendations for improving occupancy rates and customer satisfaction.

#### User Behavior Analysis:

 Analyze user behavior to identify patterns and trends, helping to refine marketing strategies and improve service offerings.

## 6. Sustainability and Eco-Friendly Initiatives:

#### Green Certifications and Filters:

- o Highlight hotels and rooms with green certifications and eco-friendly practices.
- o Allow users to filter and search for eco-friendly accommodation options.

#### Carbon Offset Options:

o Provide options for users to offset the carbon footprint of their stay through contributions to environmental projects.

## 7. Expanding Market Reach:

## Global Expansion:

- Expand the platform to new geographical markets, focusing on localization and cultural adaptation.
- Partnerships and Collaborations:
  - o Form strategic partnerships with travel agencies, airlines, and other travel-related businesses to broaden the user base and enhance service offerings.

## 8. Improved Administrative Tools:

#### Super Admin Features:

- O Develop more advanced tools for super admins to manage the platform, including user management, hotel verification, and dispute resolution.
- Implement automated systems for monitoring and maintaining quality standards across the platform.

# 9. Community and Social Features:

### User Reviews and Community Engagement:

- o Enhance review systems with photo and video uploads, detailed ratings, and response options for hotel owners.
- Create community forums and social features where users can share experiences, travel tips, and recommendations.

## Loyalty Programs:

 Develop loyalty programs and reward systems to encourage repeat bookings and user engagement.

## 10. Mobile App Enhancements:

#### Offline Capabilities:

 Enhance mobile app functionality to include offline access to booking details and local guides.

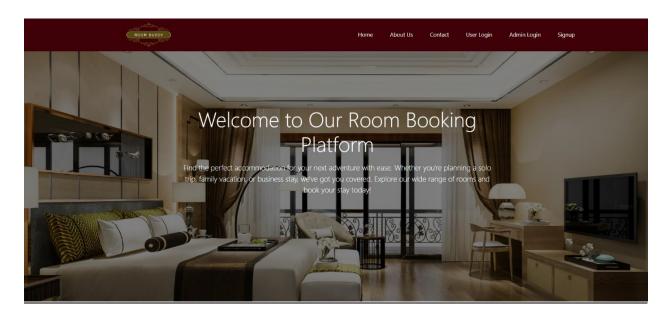
### • Augmented Reality (AR):

 Use AR to provide immersive room previews and interactive navigation within hotels.

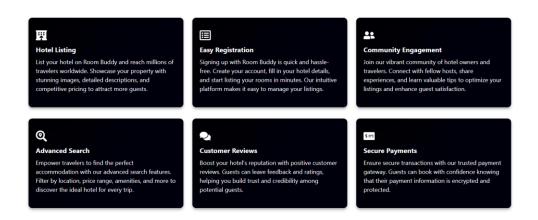
By focusing on these areas, the room booking project can evolve to meet the changing needs of users, stay ahead of competitors, and continuously improve the overall booking experience.

# **SCREENSHOTS**

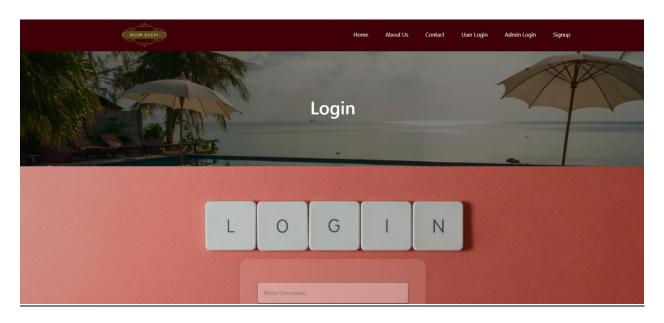
# Homepage: -



#### **Our Services**



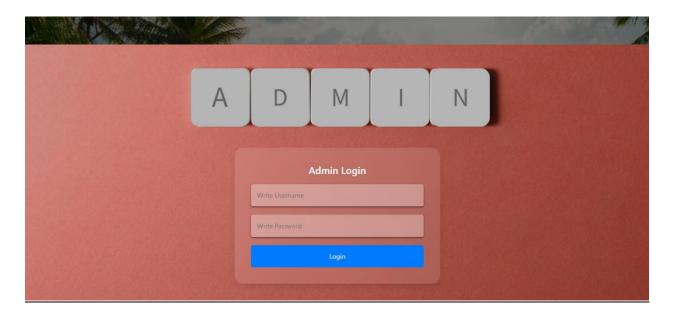
# Role-based login: -



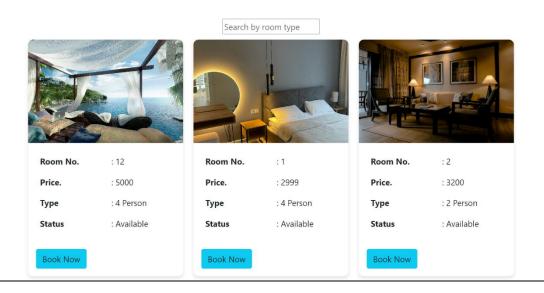
# Signup :-



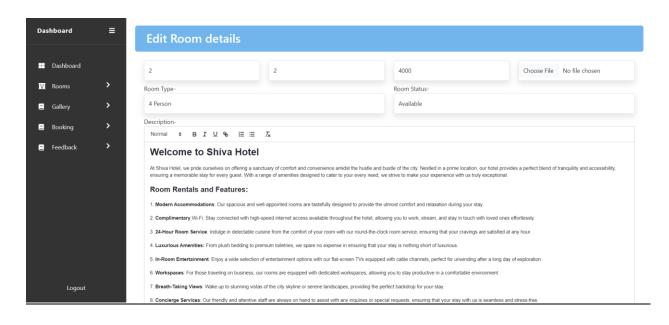
# Admin login: -

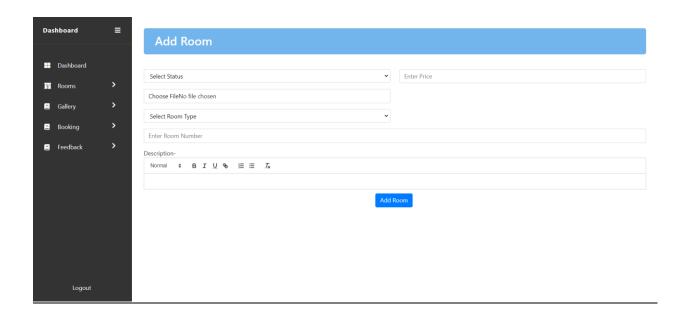


# Room type :-

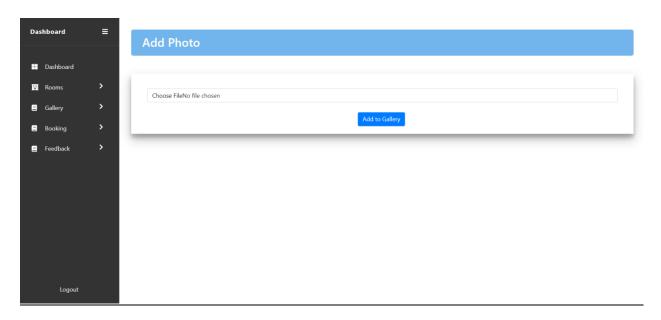


### Add rooms: -

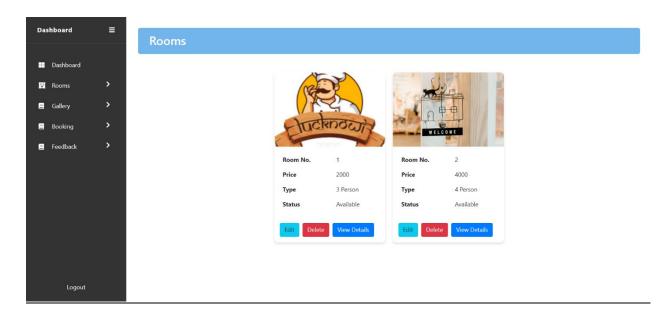




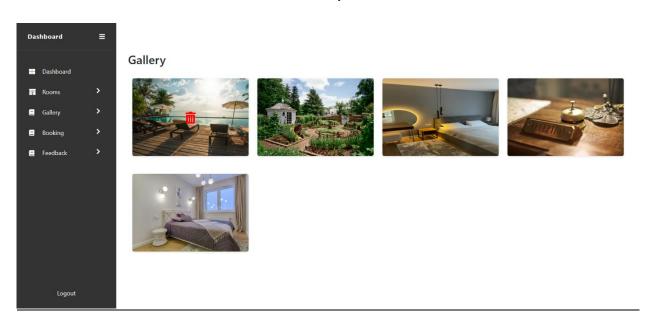
# Add photo: -



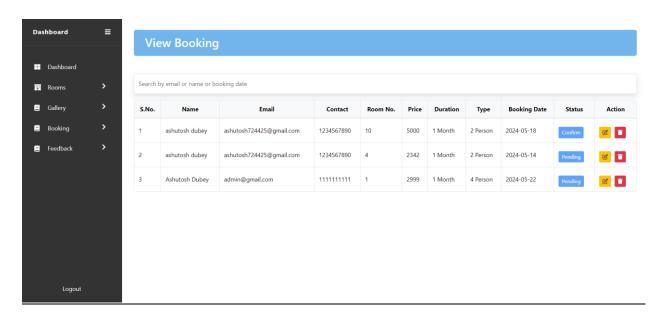
## Rooms: -

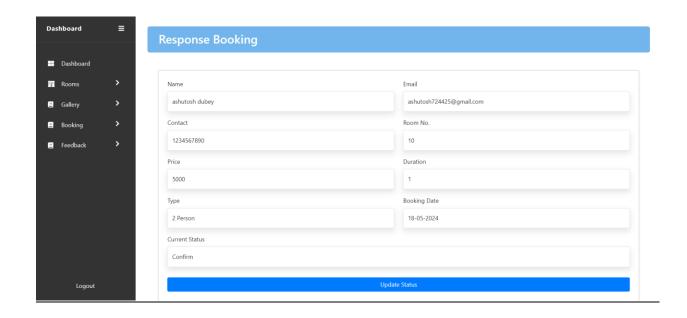


# Gallery: -



## View bookings: -



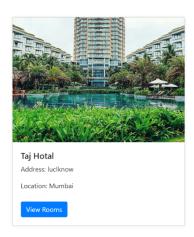


## Details: -

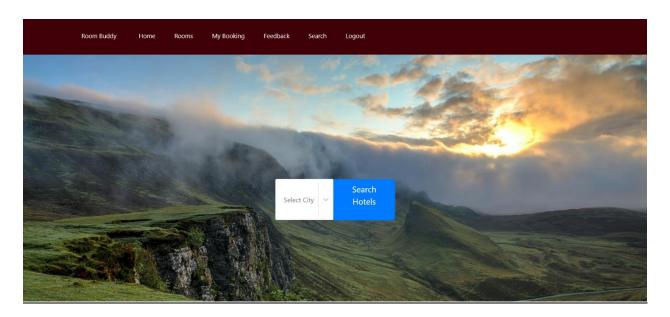


# <u>Hotels: -</u>

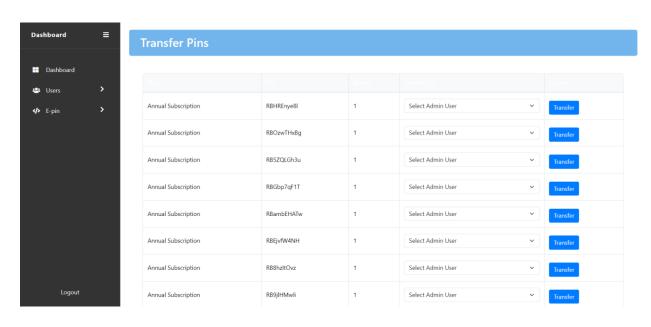
## HOTEL OWNERS IN MUMBAI

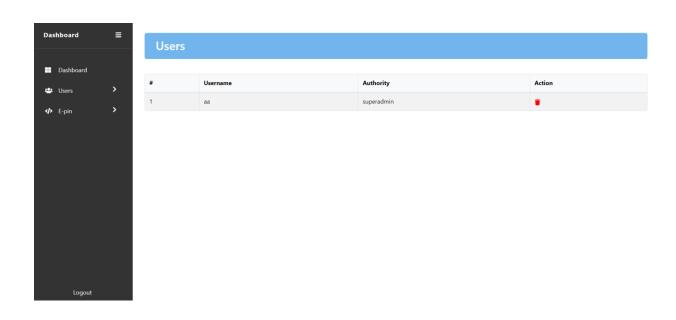


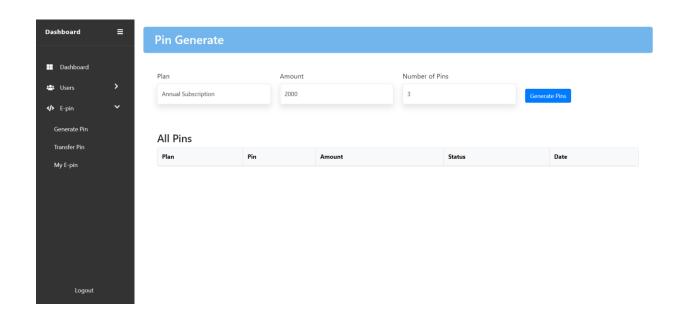
# Search Hotels: -



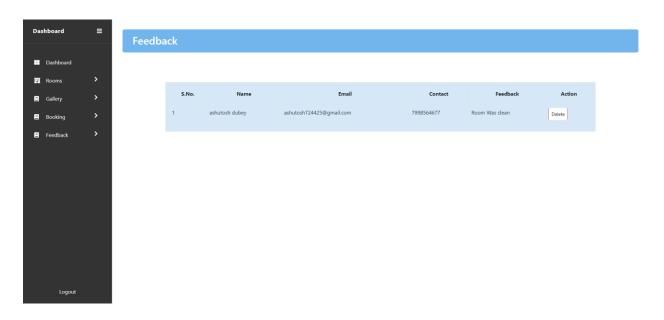
## Super admin dashboard: -



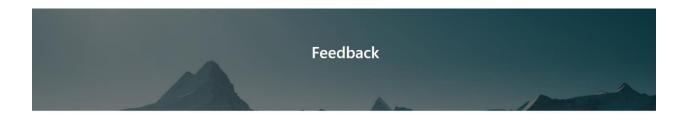




# Feedback section: -



# Feedback form: -



Feedback		
Enter your name		
Enter your email		
Enter your Contact Number		
Enter your Feedback		
Submit		

# **REFERENCES**

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Ultimate Full-Stack web development with MERN by Nabendu Viswas

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