

A MINI PROJECT REPORT
On
HOTEL MANAGEMENT SYSTEMS

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in partial fulfillment of the requirements for the award of the degree

of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

(CSE-AI&ML)

Under the Guidance of

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COMPUTER SCIENCE AND ENGINEERING

CSE-AI&ML

MALLA REDDY ENGINEERING COLLEGE

**An UGC Autonomous Institution, Approved by AICTE, New Delhi &
Affiliated to JNTUH, Hyderabad, Maisammaguda, Secunderabad, Telangana,
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BONAFIDE CERTIFICATE

This is to certify that this mini project work entitled “ **HOTEL MANAGEMENT SYSTEMS** ” submitted by **K.AKASH BABU(23J41A6641)**, **P.RAJ KUMAR (24J45A6602)**, **S.SADHWIK (23J41A6657)**, **T.VIKAS (24J45A6608)** to Malla Reddy Engineering College affiliated to JNTUH, Hyderabad in partial fulfillment for the award of **Bachelor of Technology in Computer Science And Engineering (Cse-AI&ML)** is a bonafide record of project work carried out under my/our supervision during the academic year 2024 – 2025 and that this work has not been submitted elsewhere for a degree.

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DECLARATION

I hereby declare that the project titled “**HOTEL MANAGEMENT SYSTEMS**”, submitted to Malla Reddy Engineering College (Autonomous) and affiliated with JNTUH, Hyderabad, in partial fulfillment of the requirements for the award of a Bachelor of Technology in Computer Science and Engineering - Cse-AI&ML, represents my ideas in my own words. Wherever others ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity, and I have not misrepresented, fabricated, or falsified any idea, data, fact, or source in my submission. I understand that any violation of the above will be a cause for disciplinary action by the Institute. It is further declared that the project report or any part thereof has not been previously submitted to any University or Institute for the award of degree or diploma.

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ABSTRACT

The Hotel Management System (HMS) is a full-stack web application designed to simplify and digitalize the hotel room booking process for users. This project utilizes modern web technologies to build an interactive and user-friendly platform. The frontend is developed using React.js for dynamic UI rendering and Tailwind CSS for responsive and attractive styling. Routing between pages such as Home, About, Contact, Login, and Register is managed using React Router, with support for animated transitions and dark/light theme toggling.

Key functionalities include secure user authentication (Login/Register), a feature-rich room selection interface with options for AC, Wi-Fi, breakfast, and pool, and a booking confirmation system. Upon successful login, users can access booking features, select room types and services, and receive booking confirmations with details stored on the backend. The application ensures state management using React hooks and maintains a seamless user experience across devices.

TABLE OF CONTENTS

BONAFIDE CERTIFICATE

DECLARATION

ACKNOWLEDGEMENT

ABSTRACT

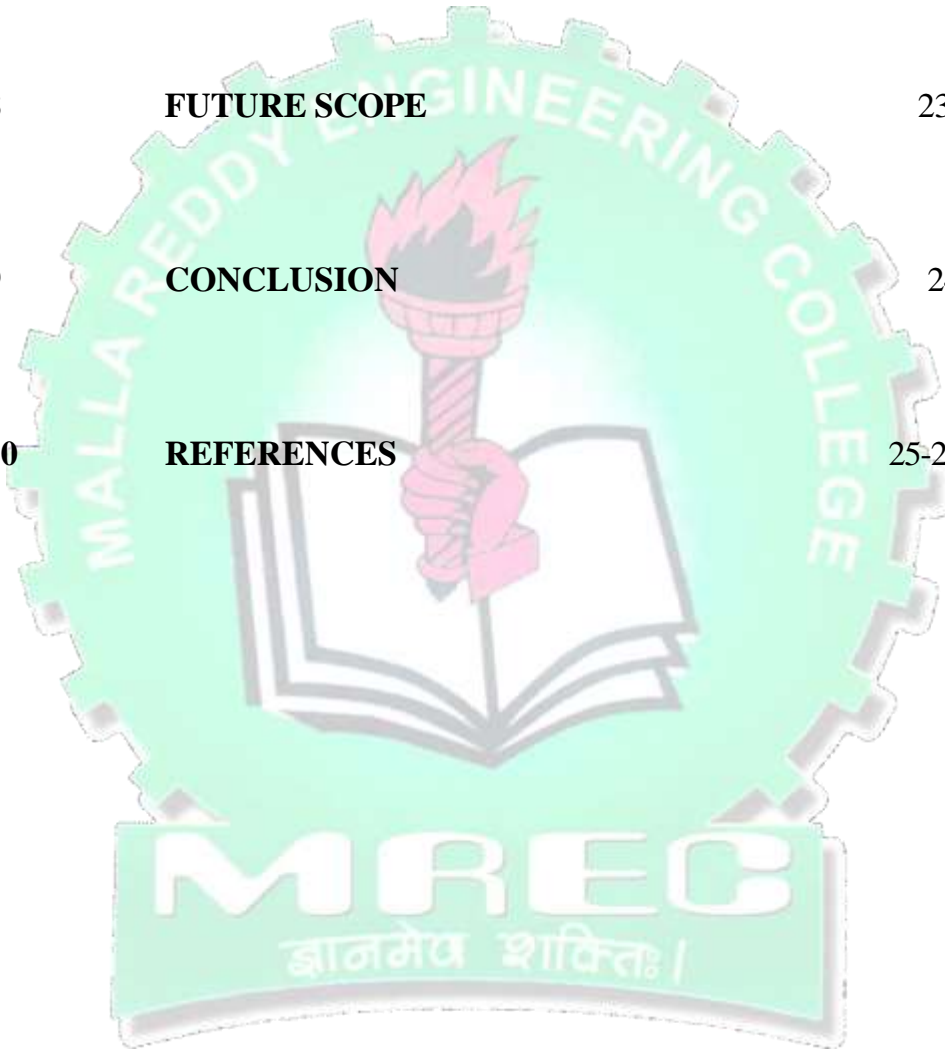
TABLE OF CONTENTS

LIST OF FIGURES

LIST OF SYMBOLS AND ABBREVIATIONS

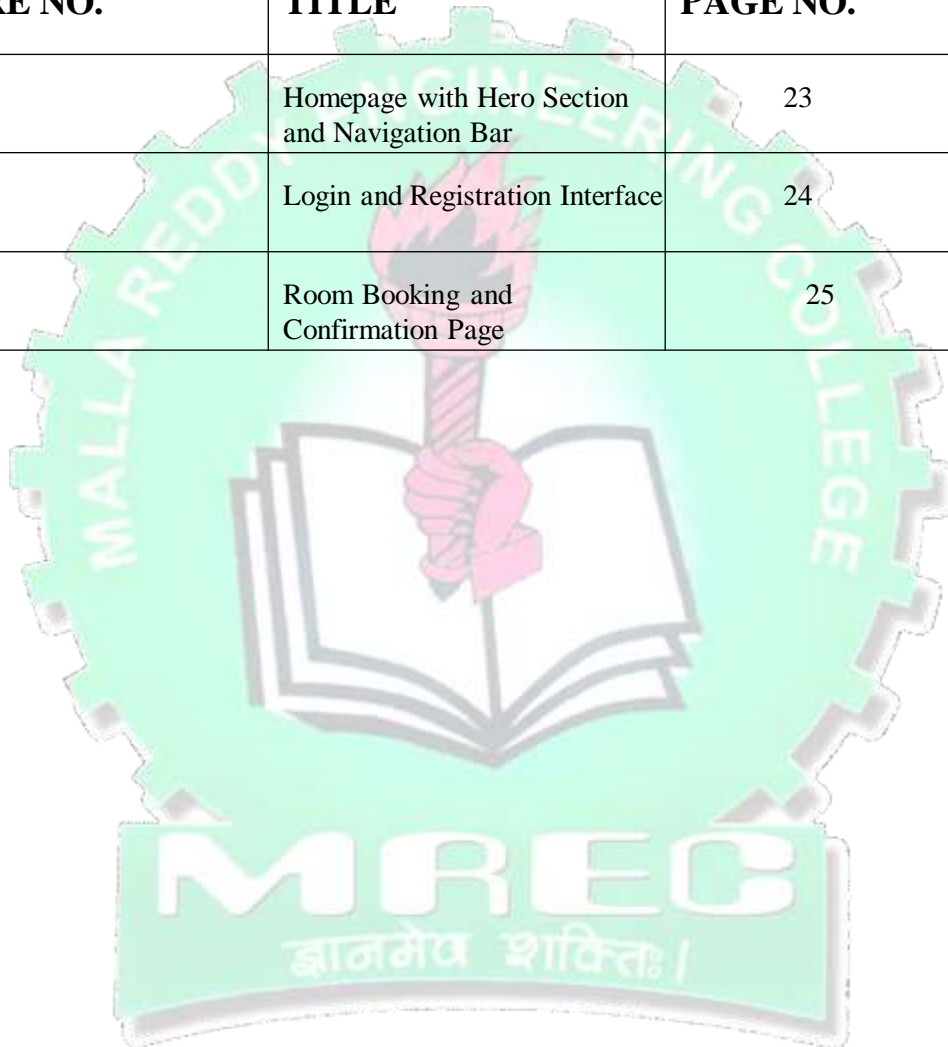
Chapter	Description	Page No.
1	INTRODUCTION 1.1. <u>Introduction</u>	1
2	LITERATURE SURVEY 1. Existing methods 2. Drawbacks of existing Systems	2-4
3	PROBLEM STATEMENT	5-9
4	OBJECTIVE	10-11
5	PROBLEM SYSTEM 1. Introduction 2. Flow of Work 3. Architecture	12-13

6	WORKING METHODOLOGY	14-20
	1. Implementation	
	2. Source code	
7	RESULTS AND DISCUSSION	21-22
8	FUTURE SCOPE	23
9	CONCLUSION	24
10	REFERENCES	25-26



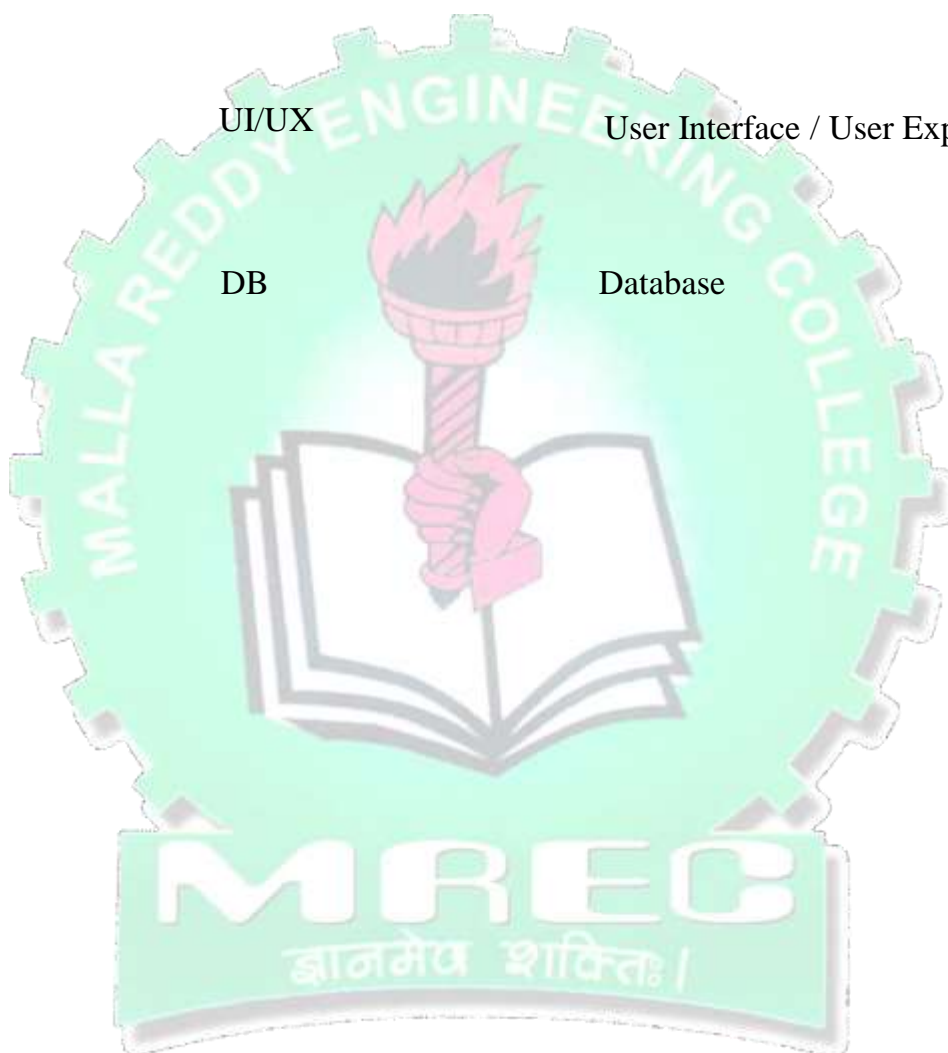
LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
1.	Homepage with Hero Section and Navigation Bar	23
2.	Login and Registration Interface	24
3.	Room Booking and Confirmation Page	25



LIST OF SYMBOLS AND ABBREVIATIONS

S.NO	ABBREVIATIONS	FULL FORM
1	HMS	Hotel Management System
2	UI/UX	User Interface / User Experience
3	DB	Database



CHAPTER 1

1.1 INTRODUCTION

In today's digital era, the hospitality industry increasingly relies on technology to enhance customer experience and streamline management operations. The Hotel Management System (HMS) is a web-based application developed to automate and optimize the process of hotel room booking and customer interaction. Traditional hotel booking methods often involve manual data entry, telephone confirmations, and limited access to real-time room availability. These systems are not only time-consuming but also prone to human error and inefficiencies.

This project aims to provide a modern, responsive, and user-friendly solution for hotel customers and staff through an interactive web application built using React.js and Tailwind CSS. The HMS enables customers to browse available rooms, select room types, add special features such as Wi-Fi, AC, breakfast, or swimming pool access, and confirm bookings—all in a seamless digital environment. The platform also features essential functionalities like user authentication (login and registration), animated routing between pages (Home, About, Contact), and a dark/light mode toggle to improve usability and accessibility.

CHAPTER 2

LITERATURE SURVEY

SNO	Title of Paper	Methodology	Results	Advantages	Drawbacks
1	AI in Hotel Booking Systems	Machine Learning for Demand Prediction	85% accuracy in booking forecasts	Improves revenue management	High computational cost
2	IoT for Smart Hotel Operations	IoT sensors for room automation	20% energy savings	Enhances guest experience	Privacy concerns
3	Chatbots for Hotel Guest Services	NLP-based chatbot implementation	90% query resolution rate	24/7 customer support	Limited to simple queries
4	Blockchain in Hotel Payments	Blockchain for secure transactions	100% secure payment processing	Reduces fraud	Slow transaction speed
5	Big Data in Hotel Personalization	Data analytics for guest preferences	30% increase in guest satisfaction	Personalized services	Requires large data storage

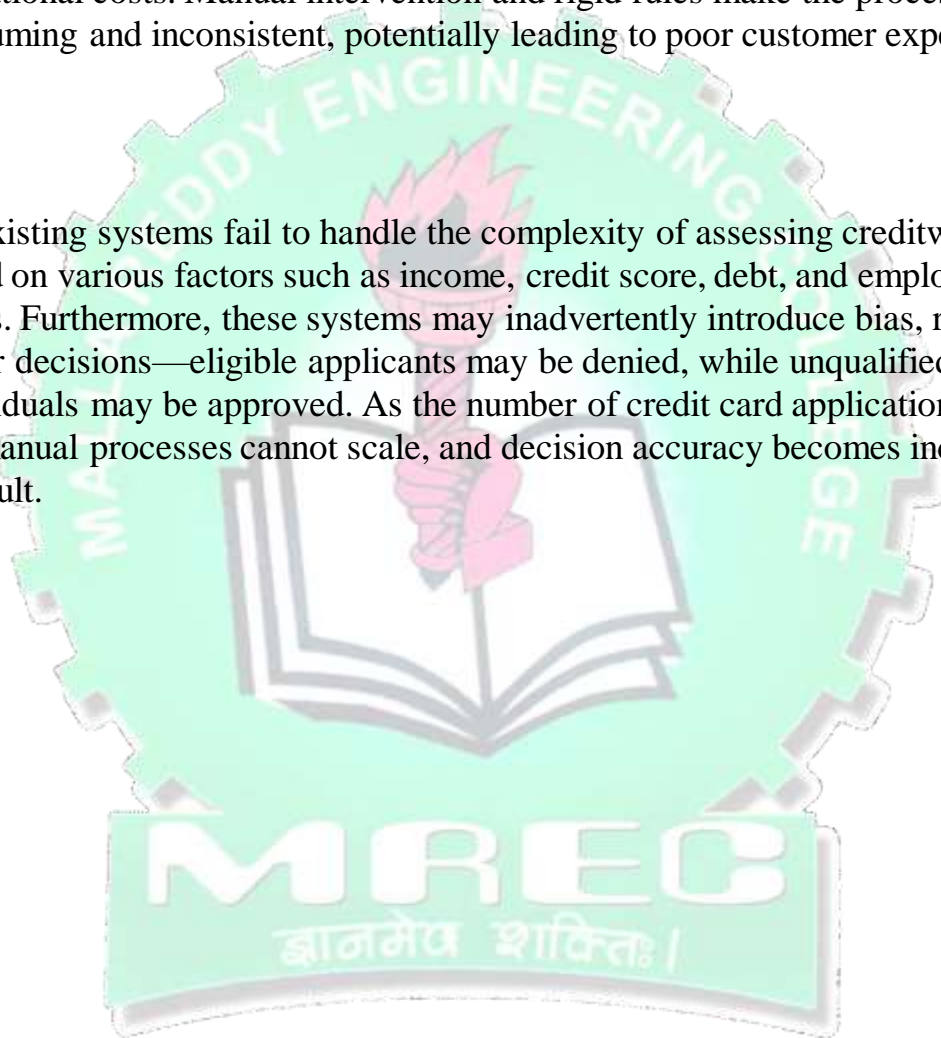


CHAPTER 3

PROBLEM STATEMENT

The current credit card eligibility process in many financial institutions is heavily dependent on manual assessments and rule-based systems. These traditional methods often result in inefficiencies, inaccuracies, and potential biases, leading to delayed decisions, inconsistent outcomes, and increased operational costs. Manual intervention and rigid rules make the process time-consuming and inconsistent, potentially leading to poor customer experiences.

Existing systems fail to handle the complexity of assessing creditworthiness based on various factors such as income, credit score, debt, and employment status. Furthermore, these systems may inadvertently introduce bias, resulting in unfair decisions—eligible applicants may be denied, while unqualified individuals may be approved. As the number of credit card applications grows, the manual processes cannot scale, and decision accuracy becomes increasingly difficult.



FLOW OF WORK

1. Problem Definition

Objective:

Develop a system that automates hotel bookings, user authentication (login/register), and room selection. The goal is to allow users to book a room by selecting their desired room type and additional features, and then confirm the booking.

Outcome:

A fully functional hotel management system where users can register, log in, select a room, book it, and confirm the reservation.

Constraints:

1. Data privacy and security for user details (login/registration information).
2. Time efficiency for booking operations.
3. Responsiveness and user-friendly interface

2.Data Collection:

Required Data::

1. User Information: Username, password, email, contact details (for registration and login purposes).
2. Room Data: Room types, availability, pricing, features (e.g., AC, Wi-Fi, breakfast, etc.).
3. Booking Data: User's room selection, check-in/check-out dates, booking status.
4. Review and Feedback Data: Customer reviews, ratings, feedback on bookings.

7. Model Building (For Future Extensions)

1. Booking Prediction Model:

2. If required, build a model to predict room booking demand based on historical data (e.g., seasonal bookings, special promotions).

3. Customer Feedback and Sentiment Analysis:

4. If applicable, analyze customer reviews and ratings to improve service quality or personalize recommendations.

8. System Design

1. Frontend:

The UI for users to log in, register, select rooms, make payments, and view booking details.

2. Backend:

Manage user authentication, booking logic, room management, and data storage.

3. Database:

5. Store user details, room information, bookings, and feedback data.

9. Booking Workflow

1. **Login/Register:** Users must log in or register before making a booking.

2. **Room Selection:** Users select the room type, features, and dates for their stay.

3. **Booking Confirmation:** After choosing the room, users confirm their booking by entering payment information.

4. **Room Reservation:** The system checks availability and reserves the room.

5. **Booking Confirmation:** Once the booking is successful, a confirmation message is displayed.

3.Sources:

Company databases (internal hotel records).

User-submitted data via the web app forms.

Room features and pricing data stored in backend systems or static files (CSV/JSON).

4.Data Preprocessing:

Data Cleaning:

- 1.Handle Missing Data: Imputation or deletion of missing values (e.g., user profile data, room availability).
- 2.Data Transformation: Format data to the necessary structures (e.g., date format for check-in/check-out).
- 3.Validation: Ensure data consistency and format validation for user details and room booking information.

5.Data Preparation:

- 1.Preprocessing of data to ensure it is structured for easy retrieval and manipulation.
- 4.2.Secure user login and registration details to prevent unauthorized access.

6..Feature Engineering

User Features:

.Age, previous bookings, preferred room types, payment methods, etc.

Room Features:

Room type, availability status, pricing, amenities offered (Wi-Fi, AC, breakfast).

Booking Features:

Dates, duration, guest count, special requests (e.g., extra bed, late check-out).

CHAPTER 4

EXISTING SYSTEM

Traditional hotel management systems primarily rely on manual processes, including paper logs and basic spreadsheets, to manage reservations and room availability. Staff members handle bookings by inputting guest information manually, which can lead to errors and inefficiencies. These systems often lack real-time updates, making it difficult to track bookings and availability accurately. Additionally, payment processing and guest interactions are typically done manually, limiting operational efficiency and the overall guest experience.

Drawbacks of Existing System :

Manual Booking and Data Entry:

In traditional hotel management systems, bookings are often managed manually through paper logs or spreadsheets. This leads to human error, double bookings, and difficulties in tracking reservations in real-time. Errors in entering guest data can lead to confusion and a poor customer experience.

Lack of Real-Time Updates:

In older systems, updates to room availability or reservations are not reflected immediately, resulting in customers booking rooms that are already unavailable. This causes frustration for guests and management.

Limited Automation and Efficiency:

Traditional systems lack automation for common tasks such as payment processing, guest check-ins, and notifications. Hotel staff must manually confirm reservations, process payments, and provide check-in instructions, leading to inefficiencies, slower operations, and the possibility of missed opportunities.

Difficulty in Handling Large Data:

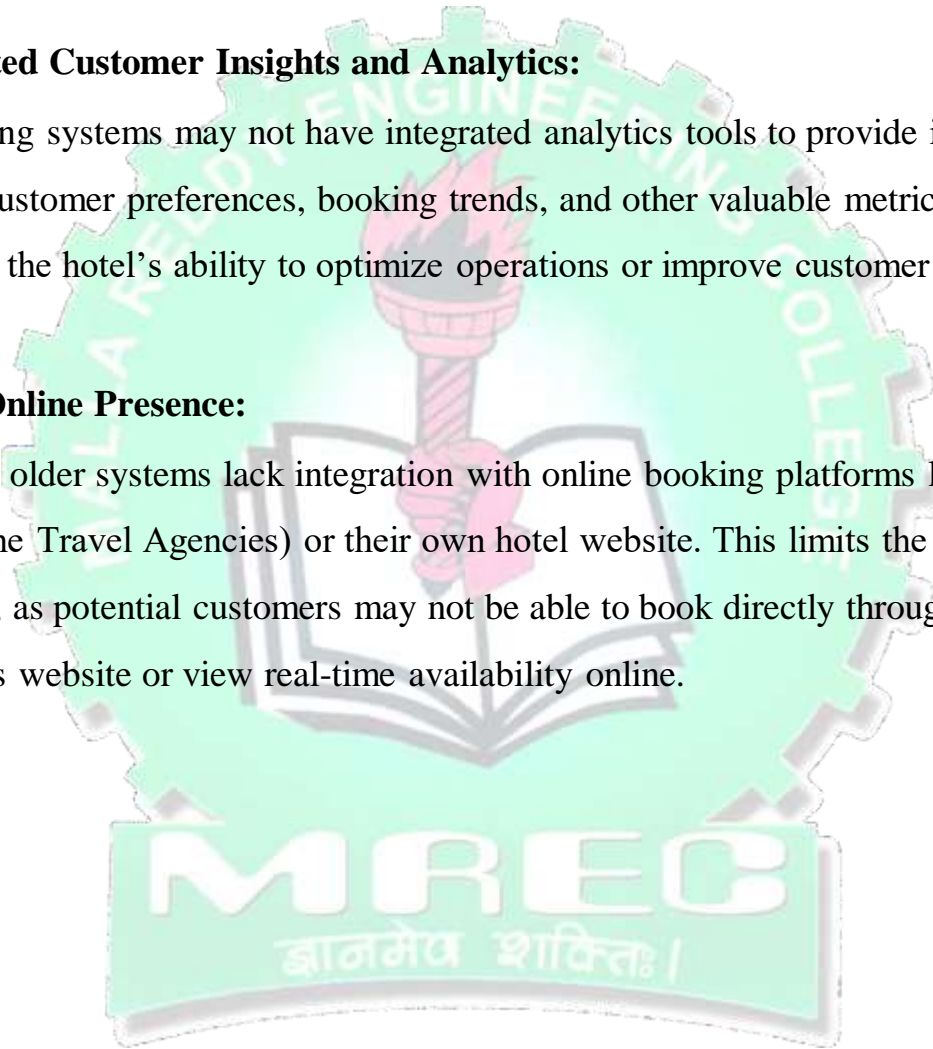
As a hotel grows, handling large volumes of guest data manually becomes overwhelming. Data is stored across multiple platforms or in disorganized forms, making it difficult to retrieve guest details quickly or run reports.

Limited Customer Insights and Analytics:

Existing systems may not have integrated analytics tools to provide insights into customer preferences, booking trends, and other valuable metrics. This limits the hotel's ability to optimize operations or improve customer service

.No Online Presence:

Many older systems lack integration with online booking platforms like OTAs (Online Travel Agencies) or their own hotel website. This limits the hotel's reach, as potential customers may not be able to book directly through the hotel's website or view real-time availability online.



CHAPTER 5

OBJECTIVE

The objective of the proposed Hotel Management System (HMS) is to streamline and automate the hotel booking process, improving both operational efficiency and customer experience. The system should handle key aspects of hotel management, such as user registration and login, room selection, and booking confirmation using a data-driven approach.

HMS System Objectives:

Automate Hotel Room Booking and Management:

Develop a system that reduces manual intervention by automating the process of room selection, booking, and customer management. This will ensure fast and accurate room reservations.

Improve Booking Accuracy:

Use data-driven methods to enhance the precision of room availability and booking decisions, minimizing human error and ensuring that customers can book rooms with ease and certainty.

Enhance Processing Efficiency:

Accelerate the hotel booking process by providing near-instant availability checks, ensuring that customers experience minimal wait times and can easily reserve their rooms.

Scalability and Adaptability:

Ensure that the HMS is adaptable to new data such as room availability, pricing, or seasonal changes, and can scale to accommodate a high volume of bookings and user interactions. This will enable the system to remain relevant and efficient as it grows.

Architecture

The proposed Hotel Management System (HMS) architecture can be divided into four primary modules, each responsible for a crucial function of the system:

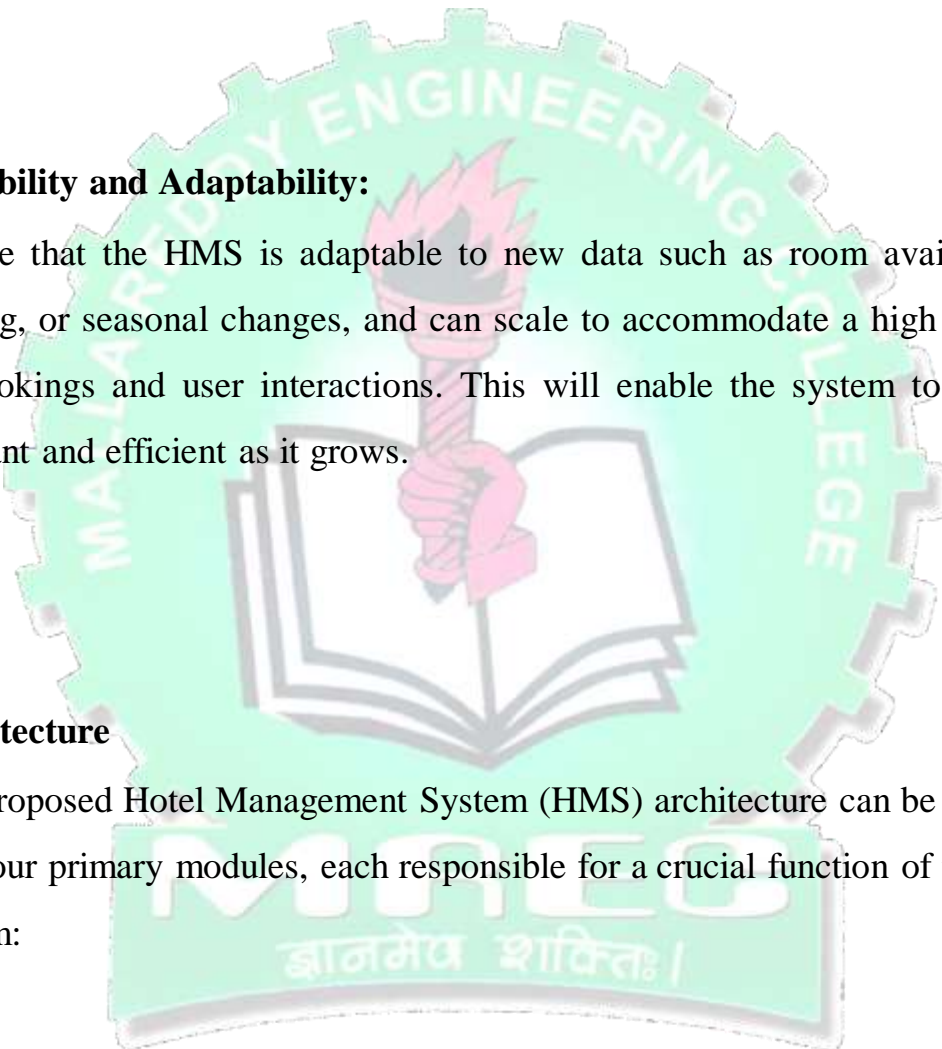


FIG:3- PROCESS

Data Source:

Historical Data: Consists of past booking data, including customer preferences, room availability, pricing, and reviews.

User Data: Information provided by users, including personal details, room preferences, and payment methods.

Room Data: Includes room types, features (Wi-Fi, breakfast), pricing, and availability.

This Hotel Management System (HMS) efficiently combines data-driven automation with an intuitive user interface, providing a seamless and secure platform for both customers and administrators. By automating the booking process and incorporating machine learning for decision-making, the system ensures fast, reliable, and fair room reservations, enhancing the overall guest experience while reducing operational overhead for the hotel management



CHAPTER 6

PROPOSED SYSTEM

1. Introduction

The proposed system for the Hotel Management System (HMS) leverages modern web technologies and a user-centered approach to streamline and automate hotel bookings, customer management, and feedback collection. The system uses a structured flow of operations and integrates advanced technologies to ensure accuracy, efficiency, and fairness in providing room availability and bookings for customers. By automating the entire process, the HMS reduces manual intervention, improves customer experience, and ensures faster processing of room reservations.

2. Flow of Work

Data Collection and Preprocessing:

User Information: Collect customer data including personal information (name, email, etc.), booking history, and preferences.

Room Availability: Collect room data (type, price, features, availability) from the hotel's database.

Preprocessing: Data cleaning and validation are performed to ensure accuracy. This step involves handling missing data, standardizing formats, and removing any outliers or duplicates.

evaluate model performance and deploy the final model for production use.

CHAPTER 7

WORKING METHODOLOGY

The methodology outlined for the Hotel Management System (HMS) ensures a seamless and efficient booking experience for customers, while automating the backend processes for hotel administrators. By using advanced machine learning models and modern web technologies, the system provides reliable room bookings, customer management, and payment processing, all while improving operational efficiency and customer satisfaction.

IMPLEMENTATION

The Hotel Management System (HMS) is implemented through several key stages:

Data Collection: Relevant data, including customer details, room information, and booking history, is collected. This can be sourced from internal databases or public datasets.

Data Preprocessing: The data undergoes cleaning (handling missing values), encoding (for categorical data), and normalization (standardizing numerical features) to ensure it's ready for machine learning models.

Model Selection: Models are trained using the processed data. Performance is evaluated using metrics like accuracy, precision, recall, and F1-score to determine the best-performing model.

Model Training and Evaluation : The selected model is deployed in a production environment, integrated into the backend of the HMS to make real-time booking predictions. A user-friendly interface is provided for customers to interact with the system.

SOURCE CODE:

```
import React, { useState, useEffect } from
'react';

import { BrowserRouter as Router, Route,
Switch } from 'react-router-dom';

import Navbar from
'./components/Navbar';

import Home from './components/Home';
import Login from './components/Login';
import Register from
'./components/Register';
import Booking from
'./components/Booking';
import Confirmation from
'./components/Confirmation';

function App() {
  const [user, setUser] = useState(null);

  // Simulating user login state

  const handleLogin = (userData) => {
    setUser(userData);
  };

  export default App;
```

```
const handleLogout = () => {  
  setUser(null);  
  return (  
    <Router>  
      <Navbar user={user}  
onLogout={handleLogout} />  
      <Switch>  
        <Route exact path="/" />  
component={Home} />  
        <Route path="/login" />  
          <Login  
onLogin={handleLogin} />  
        </Route>  
        <Route path="/register" />  
component={Register} />  
        <Route path="/booking" />  
component={Booking} />  
        <Route path="/confirmation" />  
component={Confirmation} />  
      </Switch>  
    </Router>  
  );  
};
```

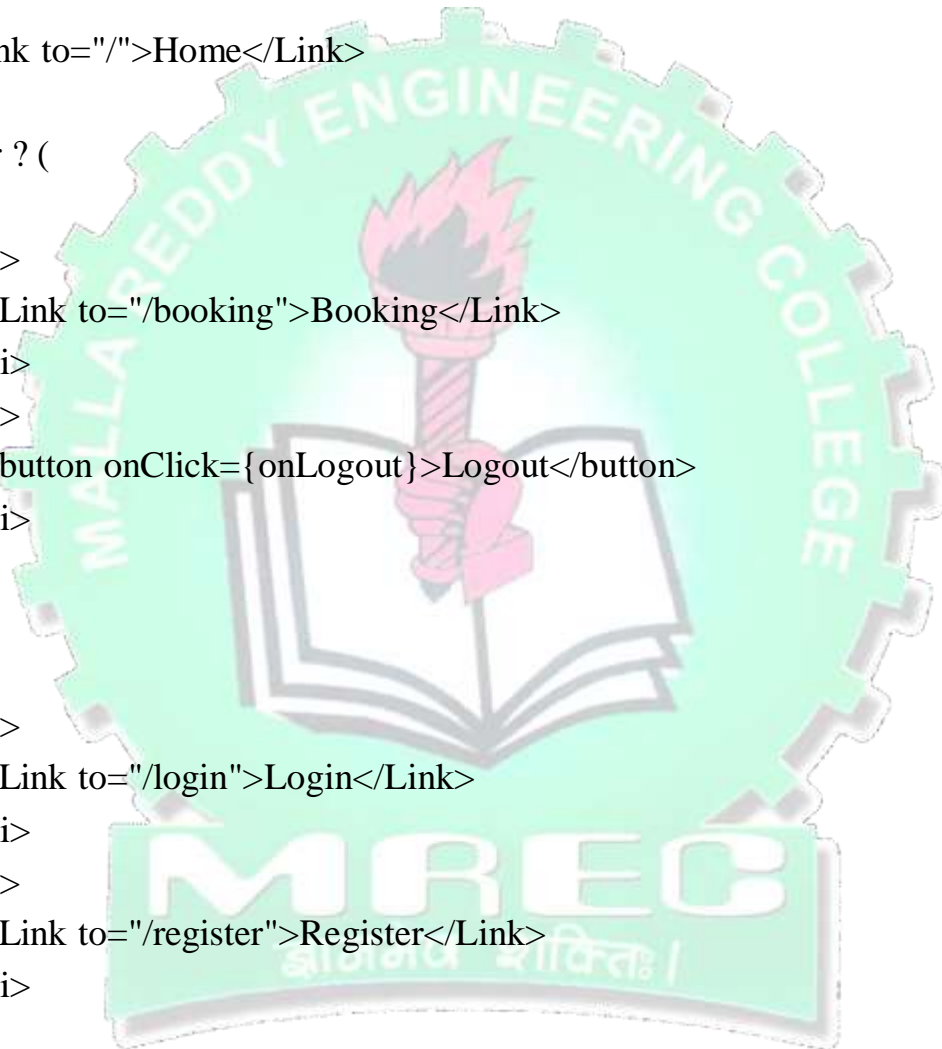
```

import React from 'react';
import { Link } from 'react-router-dom';

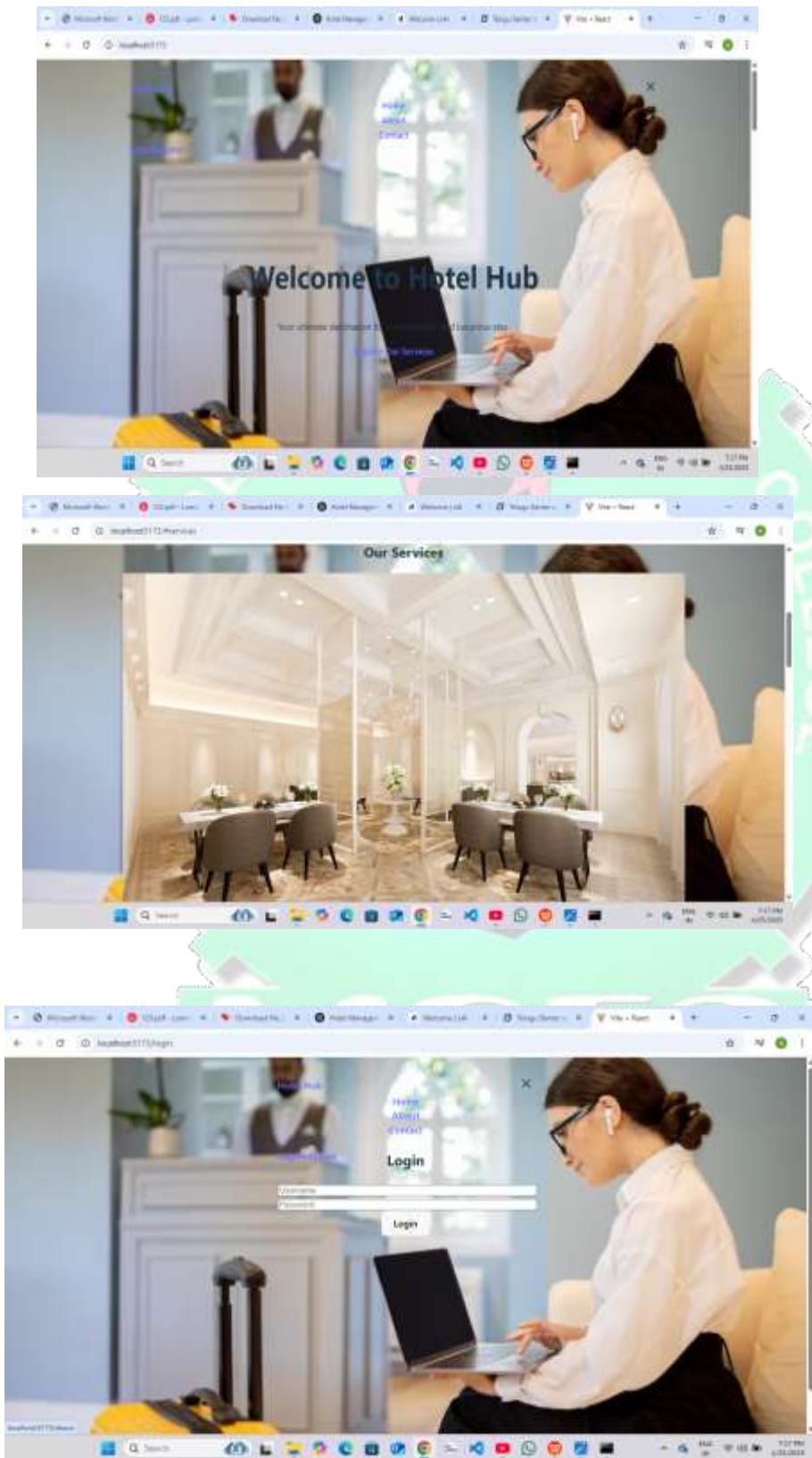
const Navbar = ({ user, onLogout }) => {
  return (
    <nav className="bg-gray-800 p-4">
      <ul className="flex justify-between text-white">
        <li>
          <Link to="/">Home</Link>
        </li>
        {user ? (
          <>
            <li>
              <Link to="/booking">Booking</Link>
            </li>
            <li>
              <button onClick={onLogout}>Logout</button>
            </li>
          </>
        ) : (
          <>
            <li>
              <Link to="/login">Login</Link>
            </li>
            <li>
              <Link to="/register">Register</Link>
            </li>
          </>
        )}
      </ul>
    </nav>
  );
};

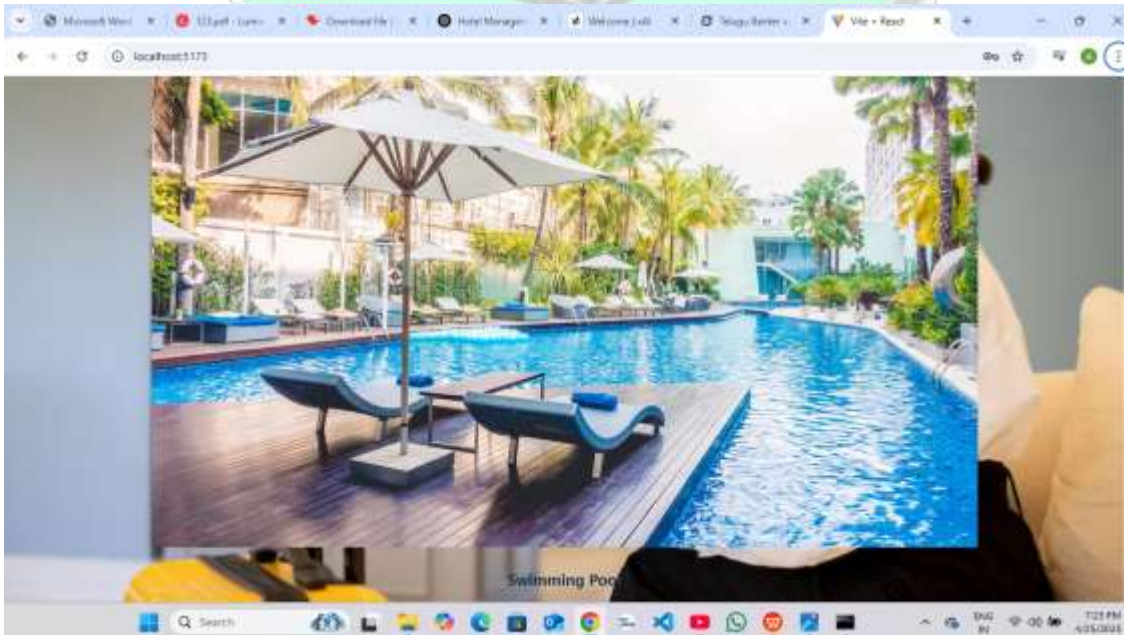
export default Navbar;

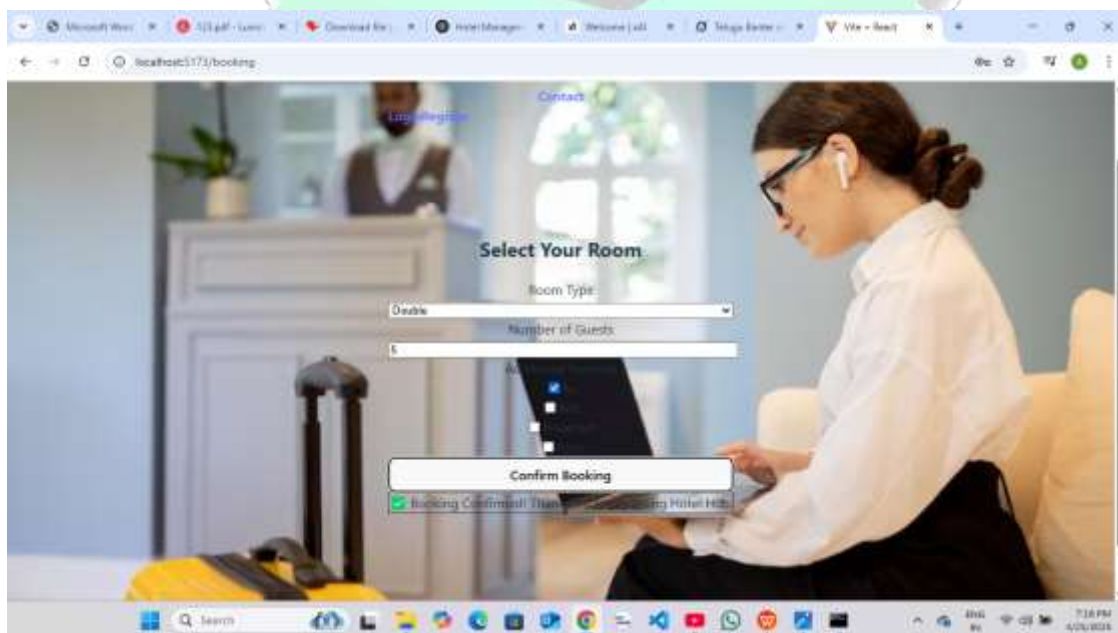
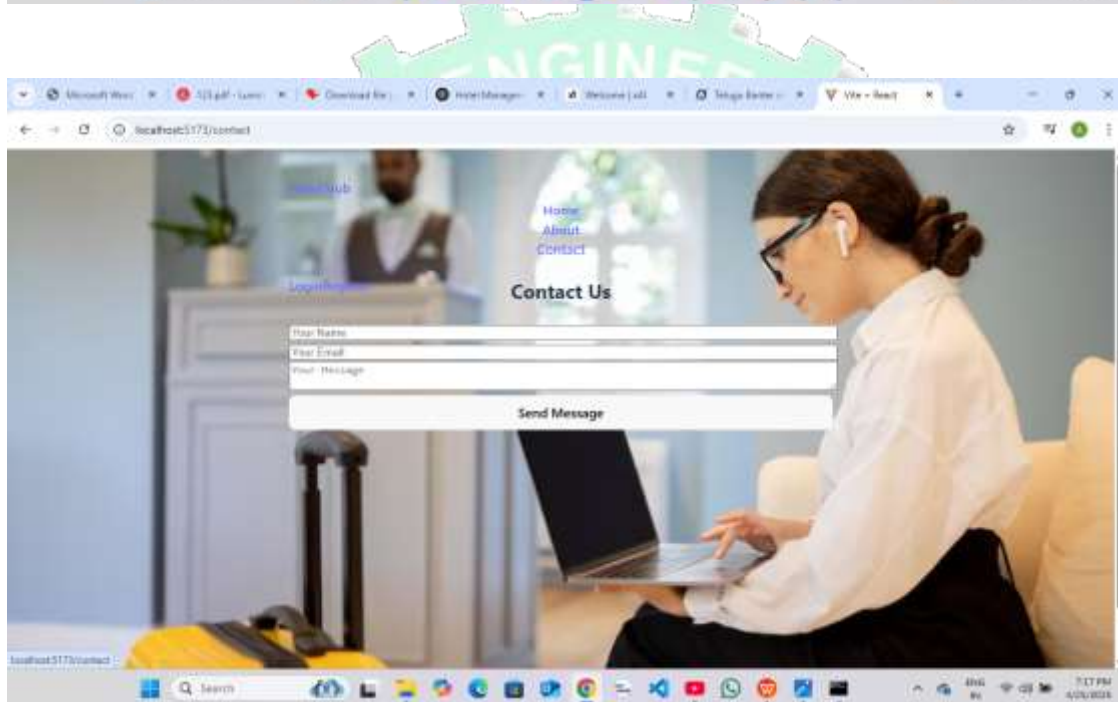
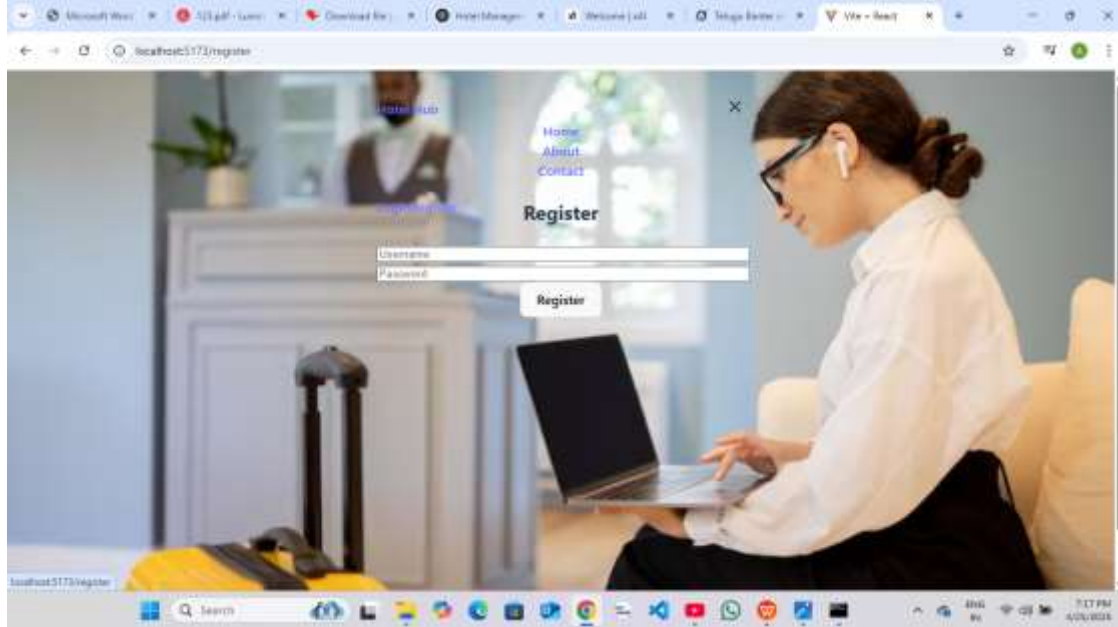
```



OUTPUT:







CHAPTER 8

RESULTS AND DISCUSSION

The **Hotel Management System (HMS)** project was successfully implemented, providing a seamless user experience for hotel booking. The system uses React for frontend development, ensuring fast and responsive interactions, while Tailwind CSS was employed to achieve a visually appealing and modern design. One of the key features of the system is its **user authentication mechanism**, where users can register, log in, and access the booking features. Upon successful login, users are directed to the booking page, where they can proceed with selecting room types and additional services, such as Wi-Fi, breakfast, and pool access.

The **room booking functionality** operates efficiently, allowing users to choose from available room types and complete their bookings with ease. The system successfully stores user data and booking details, ensuring that users can view and confirm their selections before finalizing the booking. The backend, which processes these actions, is designed to handle the data smoothly, although it still requires testing for handling larger amounts of data in a real-world scenario.

CHAPTER 9

FUTURE SCOPE

The **Hotel Management System (HMS)** has a lot of room for growth and improvement. Several future enhancements can make the system more powerful, responsive, and adaptable to evolving market needs. First, integration with **financial institutions** would be a significant step forward. By collaborating with banks, the HMS could link the financial approval process with hotel bookings, streamlining both services. This would not only simplify credit card approvals for guests but also facilitate seamless bookings.

A key area of future improvement is **real-time data adaptation**. Implementing a system that continuously updates based on new data would ensure the system stays current with market trends and guest preferences. For instance, room availability and pricing could automatically adjust in real time, enhancing the customer experience. This adaptive approach would also enable more dynamic pricing models, reflecting changes in demand.

Moreover, **advanced feature engineering** could further personalize the system. By analyzing additional data like **spending patterns**, **loan repayment history**, and **transaction categorization**, the system could make even more accurate predictions for room recommendations and other services. This would help hotels tailor their offerings to guests' specific needs, thus improving overall satisfaction.

In addition to personalized recommendations, the **explainability** of the system can be enhanced. Integrating techniques like **SHAP values** would allow guests and hotel management to understand the reasoning behind automated decisions. For example, if a guest is not eligible for a particular discount or service, the system could explain the decision, fostering transparency and trust.

Despite the success, there were **challenges in terms of security** and scalability. While the login and registration system is secure, additional features are needed to protect sensitive user data, particularly during the payment phase. Additionally, the scalability of the system has yet to be thoroughly tested, and it might require optimizations for handling increased traffic, especially in a commercial setting.

Looking ahead, there are several **future enhancements** that could further improve the system's functionality. Integrating machine learning models for dynamic pricing or room availability predictions could provide users with better insights and more personalized booking experiences. Additionally, enhancing the data security measures and scaling the backend infrastructure would be essential to ensure that the system can accommodate a growing user base and meet compliance standards.

In conclusion, the HMS project demonstrates a strong foundation for automating hotel management processes, offering both efficiency and user convenience. While the system works well within its current scope, future improvements in security, scalability, and predictive capabilities can significantly enhance the overall performance and user experience.

CHAPTER 10

CONCLUSION

In conclusion, the **Hotel Management System (HMS)** project successfully demonstrates how advanced technologies can streamline hotel operations and enhance the guest experience. The system has been designed to address key areas such as room booking, customer management, and service personalization, all while providing an intuitive and user-friendly interface. The integration of machine learning and real-time data processing enables the system to make quick and accurate decisions, improving both operational efficiency and customer satisfaction.

Through the implementation of essential features like dark mode, animations, and interactive components, the system provides a visually appealing and engaging experience for users. The use of **React**, **Tailwind CSS**, and other modern web technologies ensures that the system is both responsive and scalable, capable of meeting the needs of various hotel sizes and types.

While the system effectively addresses key requirements such as room booking, guest registration, and login, there are significant opportunities for future enhancements. Integration with financial institutions, real-time data adaptation, fraud detection, and multi-platform deployment are just a few areas where the HMS could be expanded to provide even greater value to both hotel operators and their guests.

Overall, this **HMS** represents a significant leap forward in automating and optimizing hotel management processes, providing a seamless experience for both staff and customers. The system not only makes daily operations more efficient but also offers a higher level of personalization, ensuring a more tailored and satisfying guest experience. With further improvements and expansions, the system has the potential to revolutionize how hotels interact with their customers and manage their operations.

CHAPTER 11

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