G H Patel College of Engineering & Technology

(A Constituent College of Charutar Vidya mandal University) V.V. Nagar

DEPARTMENT OF INFORMATION TECHNOLOGY

Mini Project Report

on

Hotel Management System

Submitted By

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Guided By

Dr. Miral Patel

MINI PROJECT (202040601)
A.Y. 2024-25 EVEN TERM

CERTIFICATE

This is to certify that the Mini Project Report submitted entitled "**Hotel Management System**" has been carried out by **Deep Patel** (12202080501018) under guidance in partial fulfilment for the Degree of Bachelor of Engineering in Information Technology ,6th Semester of G H Patel College of Engineering & Technology, CVM University, Vallabh Vidyanagar during the academic year 2024-25.

Dr. Miral Patel	Dr. Nikhil Gondaliya
Internal Guide	Head of Department

ACKNOWLEDGEMENT

The completion of any mini project work depends upon cooperation, coordination, and combined efforts of knowledge. We would like to express my deepest thanks to Dr. Miral Patel, for his valuable inputs, guidance, encouragement, wholehearted cooperation, and constructive criticism throughout the duration of our project.

We hope that this mini project work report will provide all necessary information required to readers to fulfil their aspiration. Theory and practices are essential and complementary to each other. We would like to express my sincere thanks to Dr. Miral Patel for wholehearted support.

Mr. Deep Patel (12202080501004)

ABSTRACT

This report presents the development and evaluation of a **Hotel Management System** utilizing modern web development and database technologies to streamline hotel operations and enhance the customer experience. The primary objective of this project is to build an efficient, secure, and user-friendly platform that facilitates online booking of hotel rooms, banquet halls, and dining services, along with real-time availability tracking and administrative control.

The methodology involved designing and implementing a web-based system that integrates key functionalities such as user registration, service selection, booking management, secure payment processing via Stripe, and automated QR code generation for check-in verification. The system offers a customer-facing interface for service browsing and booking, as well as an admin panel for managing pricing, capacity, and food menu updates. Technologies used include HTML, CSS, JavaScript for frontend development, PHP for backend logic, MySQL for data management, and third-party APIs for payments and QR code generation.

Key findings demonstrate that the Hotel Management System improves operational efficiency by automating bookings, reducing overbooking risks, and enabling contactless check-ins through unique QR codes. Administrative features empower staff with real-time control over availability and pricing, while customers benefit from a smooth, reliable, and responsive booking experience.

In conclusion, the project successfully addresses core challenges in traditional hotel operations. Future enhancements may include the integration of mobile app support, digital room access, multilingual features, and intelligent analytics to predict booking trends and improve resource allocation.

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1. Introduction

The hospitality industry is increasingly adopting digital technologies to enhance customer experiences and streamline operations. Traditional hotel booking processes often involve manual entries, long queues, and a lack of real-time data, leading to inefficiencies. This project aims to build a fully functional hotel management system that simplifies the process of room, banquet, and dining reservations while providing administrative tools for seamless backend management.

1.1 Problem Statement

Hotels face several challenges when it comes to handling reservations, especially when done manually. These include:

- Lack of instant payment confirmation.
- Limited access to real-time availability.
- Manual generation and tracking of reservation records.
- No automated way to verify bookings upon arrival.

The goal is to develop a centralized system that enables customers to book rooms, banquet halls, or dining areas online, make payments securely, and receive a unique QR code for verification. Admins should also be able to manage all reservations, modify pricing and availability, and monitor real-time statistics through a dedicated admin panel.

1.2 Aim & Objective of the Project

Aim:
To design and develop a centralized hotel management system that allows guests to digitally book services, make secure payments, and validate bookings using QR codes, while providing admins with tools to manage and monitor operations efficiently.

Objectives:

- **1. Online Booking Portal:**
  - Allow users to browse available services (room types, banquet halls, dining).
  - Enable selection of check-in/check-out dates and view real-time availability.

- **2. Secure Payment Integration:**
  - Implement Stripe to process bookings with real-time transaction confirmation.
  - Automatically update booking records upon successful payment.

- **3. QR Code Generation:**
  - Generate a unique QR code for every confirmed booking.
  - Enable guests to check in/check out by scanning the code at the front desk.

- **4. Admin Panel:**
  - Provide login-based access for admins to manage bookings, room inventory, users, and pricing.
  - Offer CRUD (Create, Read, Update, Delete) functionality for rooms and services.

- **5. Automation of Key Processes:**
  - Automate availability checks using AJAX and PHP.
  - Trigger QR code generation and download automatically on the user's device.
  - Set pricing dynamically based on room type and demand, also for banquet and dining.

- **6. Responsive UI/UX Design:**
  - Build a mobile-friendly and intuitive interface for both customers and administrators using web technologies.

- **7. Scalability and Maintainability:**
  - Design the system with modular architecture for easy maintenance and future scalability (e.g., adding more services or multi-branch support).

2. System Analysis

2.1 Motivation

The hospitality industry has faced a significant transformation in recent years, especially due to the COVID-19 pandemic. Health concerns, social distancing norms, and rising customer expectations have pushed hotels to rethink traditional operations. The motivation behind this project is to **modernize hotel booking systems** and deliver a **seamless, digital-first experience** for guests.

Key motivations include:

- **Touch-Free Experience:** Customers now prefer minimal physical contact during the check-in and booking process. A digital booking system with **QR code-based confirmations** offers a safe, contactless alternative to physical documents or front-desk interactions.
- **Operational Efficiency:** Automating room bookings, availability checks, and payment processing reduces manual workload and human errors, helping staff focus on more personalized guest services.
- **Customer Convenience:** Users can **check availability, book rooms, and complete payments online** at any time, eliminating the need for in-person visits or phone calls.
- **Scalability:** A web-based system can be easily scaled across multiple branches or properties with centralized management and real-time data synchronization.

2.2 Literature Study

Digitization in the hospitality sector has been the subject of numerous research papers and industry reports. A few key insights from the literature include:

- **Web-Based Booking Systems:**
  According to a study published in the *Journal of Hospitality and Tourism Technology*, web-based booking platforms significantly improve customer satisfaction by providing **real-time availability**, **instant confirmations**, and **personalized booking experiences**. They are also crucial in improving occupancy rates and streamlining hotel operations.

- **QR Code Integration:**
  QR codes have emerged as a reliable solution for **secure, contactless interactions**. In hotel systems, they can be used for:
  - Booking confirmations
  - Room access (via digital keys)
  - Event or dining check-ins
  - Loyalty programs and promotions

Studies in *International Journal of Contemporary Hospitality Management* highlight that QR codes improve operational efficiency while enhancing guest safety and experience.

- **Post-COVID Trends:**
  A Deloitte industry report states that **70% of hotel guests now prefer digital check-in/check-out options**. The shift is primarily driven by health safety concerns and the widespread adoption of smartphones.

- **Automation in Hospitality:**
  Automation technologies like **self-service portals, real-time notifications, and integrated payment gateways** reduce dependency on front-desk staff and deliver a smoother guest experience.

3. Requirement Analysis

3.1 Functional Requirements

- User registration and login.
- Browse room types with descriptions and prices.
- Book room, banquet, or dining with form validation.
- Secure payment gateway integration using Stripe.
- QR code generation on successful booking.
- Admin dashboard for managing availability, pricing, and food menu uploads.

3.2 Non-Functional Requirements

- System should be responsive and accessible across devices.
- Database security for storing customer and booking data.
- Real-time booking validation and error handling.

3.3 System Architecture

The system follows a **Client-Server Architecture**, where:

- Frontend is handled using **HTML, CSS, JavaScript**.
- Backend is powered by **PHP**.
- Data storage and retrieval are handled using **MySQL**.
- Stripe is used for payment processing.
- QR codes are generated using third-party libraries in PHP.

3.4 Module Specification

- **User Module**: Registration, login, and personal booking view.
- **Booking Module**: Handles availability checks and form submissions.
- **Payment Module**: Collects and processes payments via Stripe.
- **QR Code Module**: Generates downloadable QR codes containing user and booking data.
- **Admin Module**: Allows real-time updates to room types, banquet/dining capacity, menu image uploads, and booking tracking.

3.5 Database Design

Key Tables:

- users: Stores user credentials.
- admin: Admin login credentials.
- bookings: Records room bookings for all the type.
- food_menu_images: Stores file paths to uploaded food menu images.
- banquet: Records banquet bookings.
- dining: Records dining bookings.
- footer_content: Stores all the content of the footer for the updating.
- qrr_codes: Stores the path of all the QR-Codes downloaded for the customer.
- rooms: Stores the type of rooms and its capacity with price per night.
- banquet_dining_set: Stores the capacity and price of both Banquet and Dining.

3.6 Timeline Chart

Phase	Time Estimate (Weeks)
1. Project Planning and Setup	2
2. Wireframing the UI using Visily	1
2. Designing System Architecture and Database Schema	1
3. User side Development (Login, Register, Password reset)	2
4. Implementing Booking System	2
5. Admin Panel Development (Login)	2
6. Implementation of features in the Admin Panel	2
7. Bug Fixes, Documentation & Report Writing	1
Total Duration	**13 Weeks**

3.7 UML Diagram

3.6.1 Block Diagram

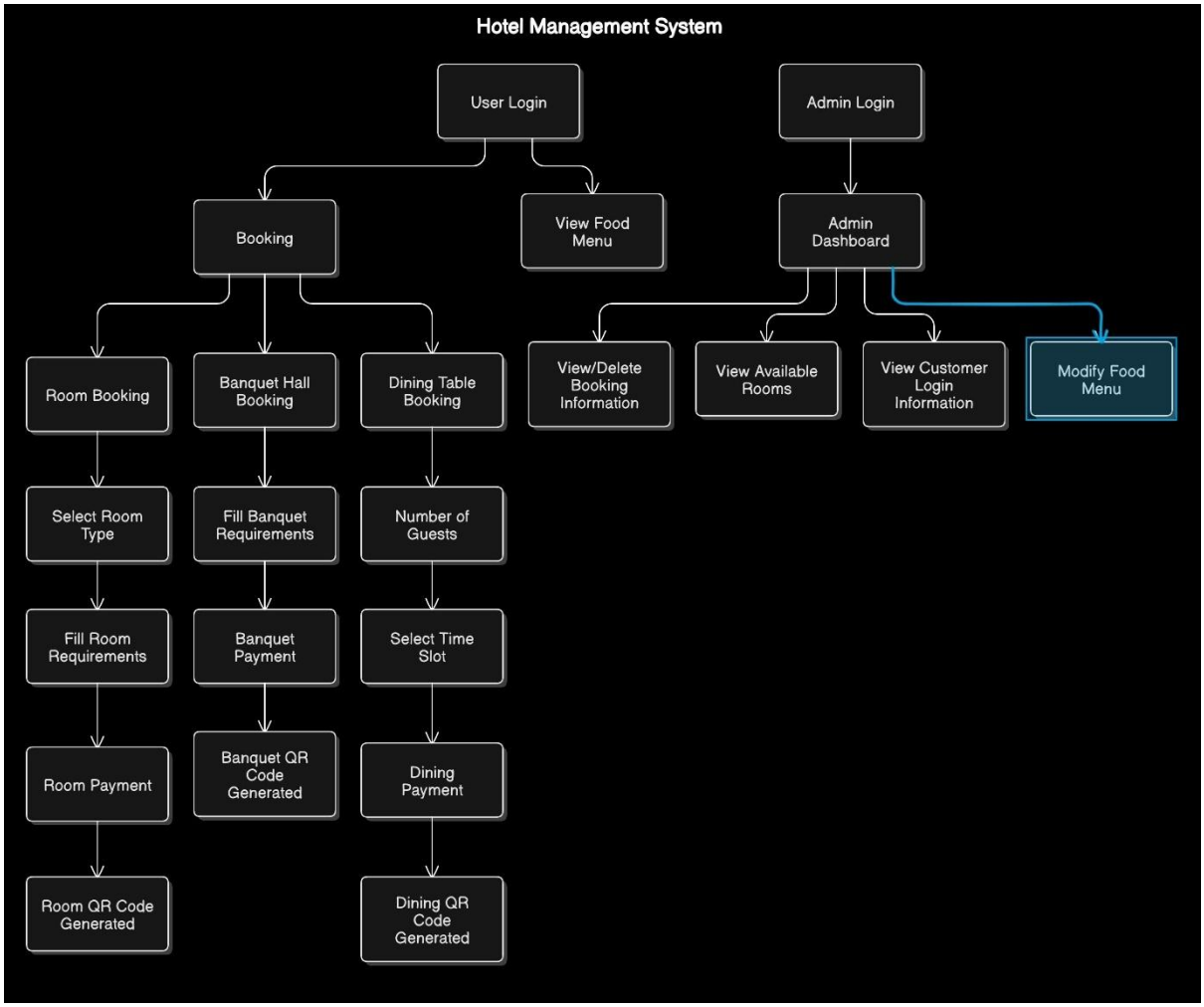

Figure-1: Block Diagram

3.6.2 Usecase Diagram

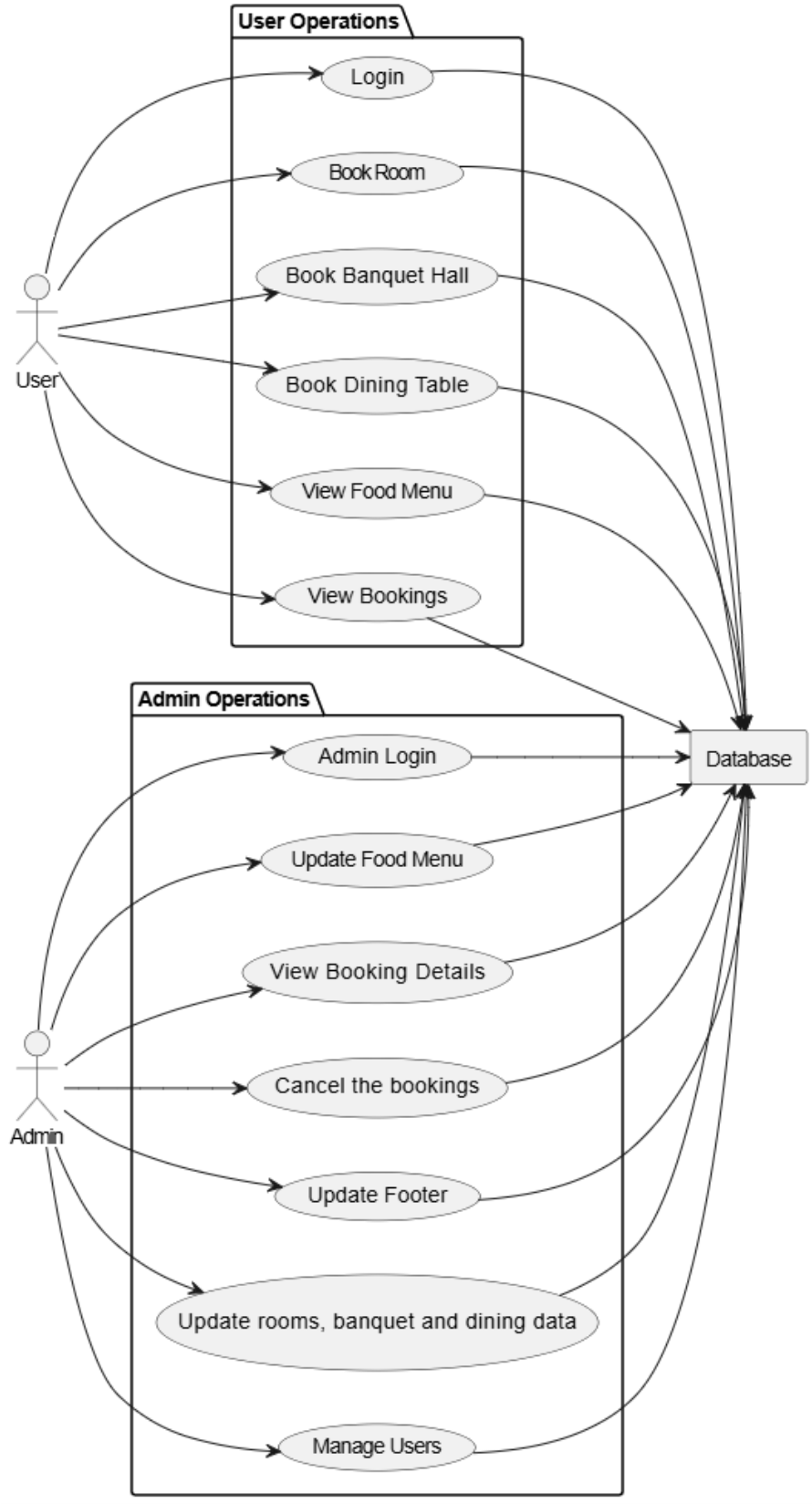

Figure-2: Usecase Diagram

3.6.3 Sequence Diagram

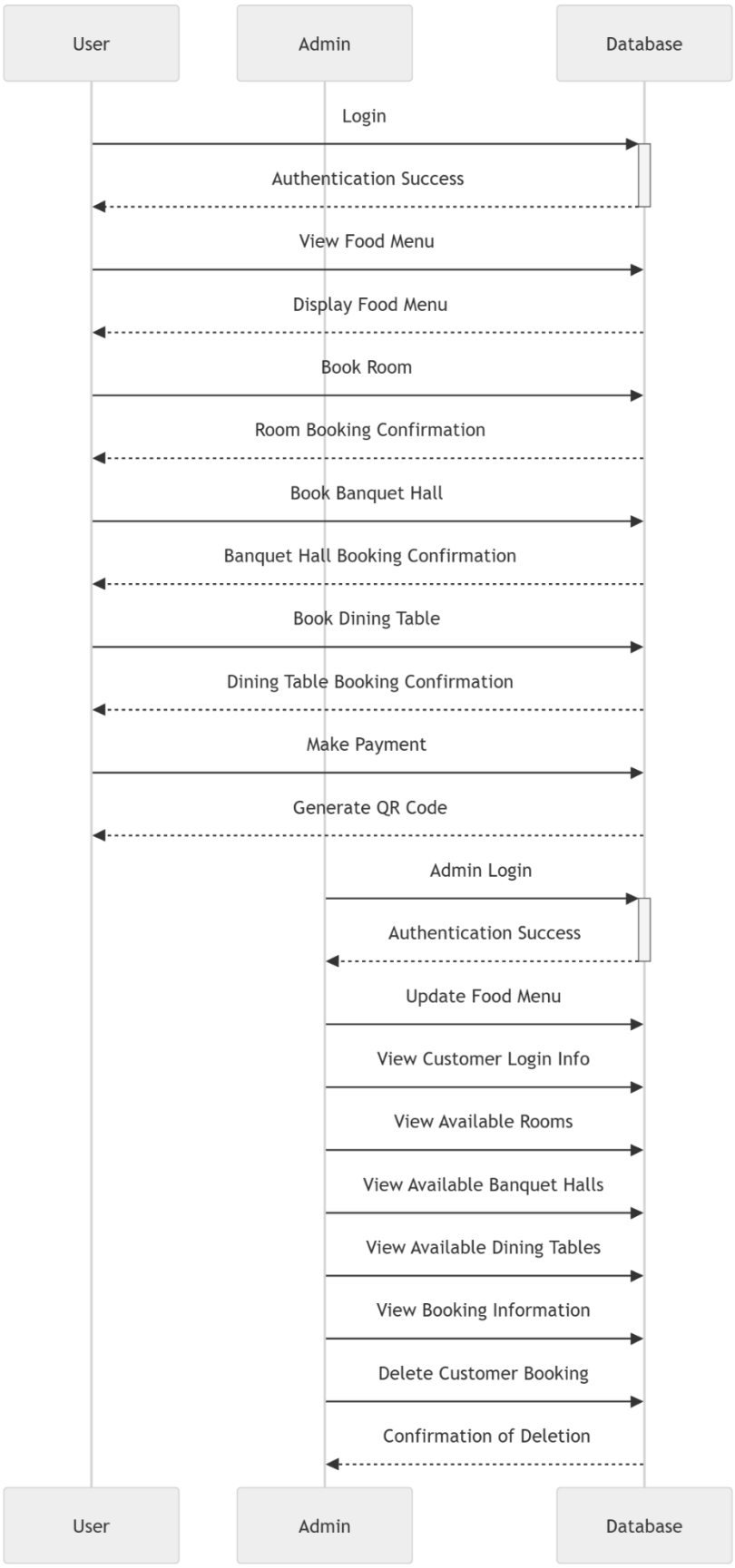

Figure-3: Sequence Diagram

3.6.4 Class Diagram

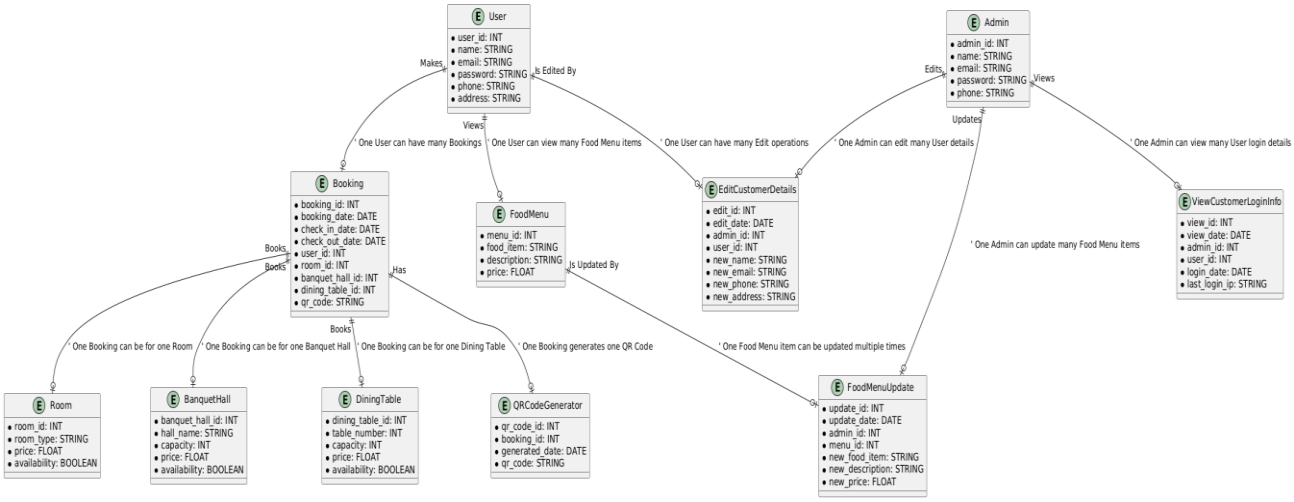

Figure-4: Class Diagram

4. Implementation

4.1 System Flow

The implementation of the **Hotel Management System** follows a modular, full-stack architecture integrating **HTML/CSS/JS (frontend)**, **PHP (backend)**, and **MySQL (database)** to ensure smooth, secure, and efficient operations for both customers and hotel staff/admins.

4.1.1. User Registration/Login

- Users register and log in using a user-friendly interface.
- Form data is submitted to the server via POST and handled using PHP sessions.
- On successful login, sessions are created, and users are redirected to their dashboard.
- User data is managed in the users table in MySQL.

4.1.2. Room/Banquet/Dining Browsing

- Users access pages like rooms, banquet hall or dining.
- They can:
  - View availability in real-time.
  - Check pricing, capacity, and descriptions.
- Data is dynamically fetched from the backend and rendered in form.

4.1.3. Booking Process

- Users select date, time, and room/banquet/dining options and click "Book Now".
- Booking details are submitted.
- Server validates data, checks availability, and initiates the **Stripe payment**.
- On successful payment:
  - Data is stored in the bookings table.
  - A unique **QR code is generated** and downloaded on the user system.
  - The QR code is downloaded for offline check-in.

4.1.4. Admin Dashboard and Content Management

- Admins log in via a secured login panel.
- They access admin panel, which provides:
  - Booking overview (room, banquet, dining).
  - Real-time availability statistics.
  - Uploading and managing **food menu images**.
  - Editing price and capacity:
    - For banquet,
    - For dining,
    - For rooms.

4.1.5. Payment Integration

- Integrated using **Stripe Checkout**.
- Booking amount is dynamically passed from the selected service.
- Stripe verifies the payment and returns a success/failure response.
- On success:
  - A booking is confirmed.
  - A QR code is generated via the phpqrcode library.
  - Confirmation is shown to the user.

4.1.6. System Summary

This end-to-end flow provides:

- Smooth user onboarding and booking.
- Real-time availability checks.
- QR-based digital check-ins.
- Admin capabilities to update settings on-the-go.
- Secure Stripe-based payments.

4.2 User side system

4.2.1 User login

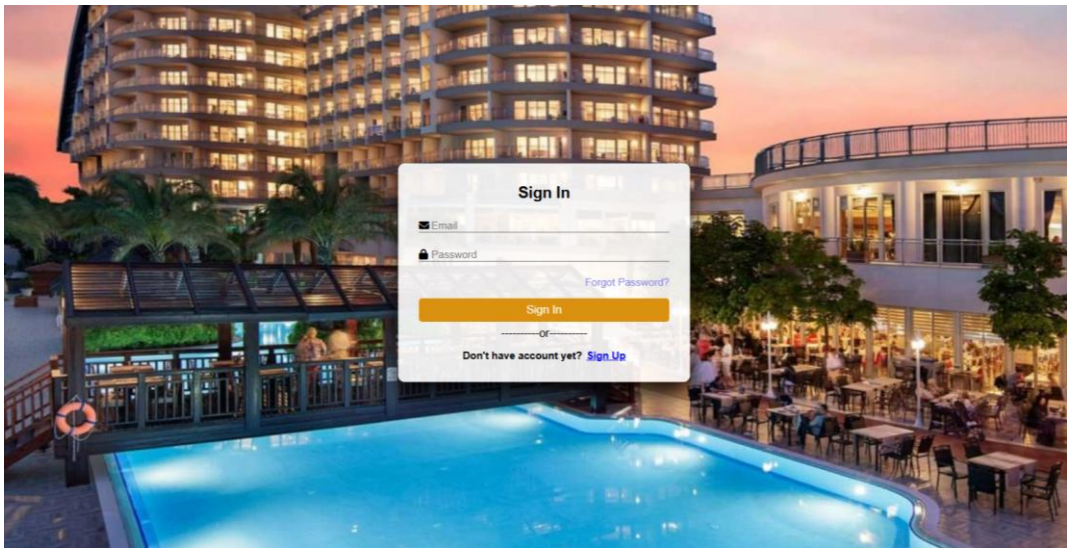

Figure-5: User Login

4.2.2 Rooms

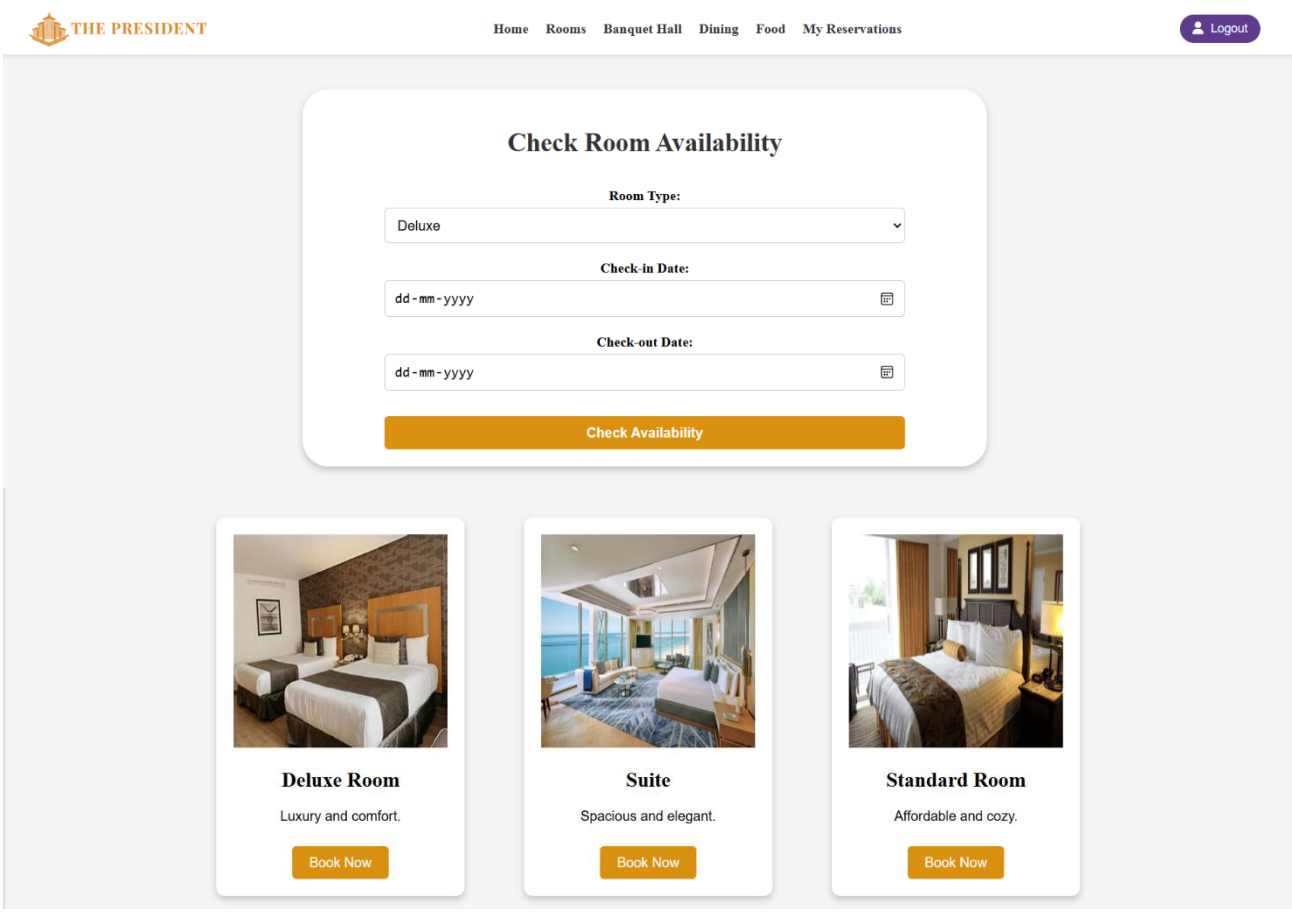

Figure-6: Rooms

4.2.3 Room Booking

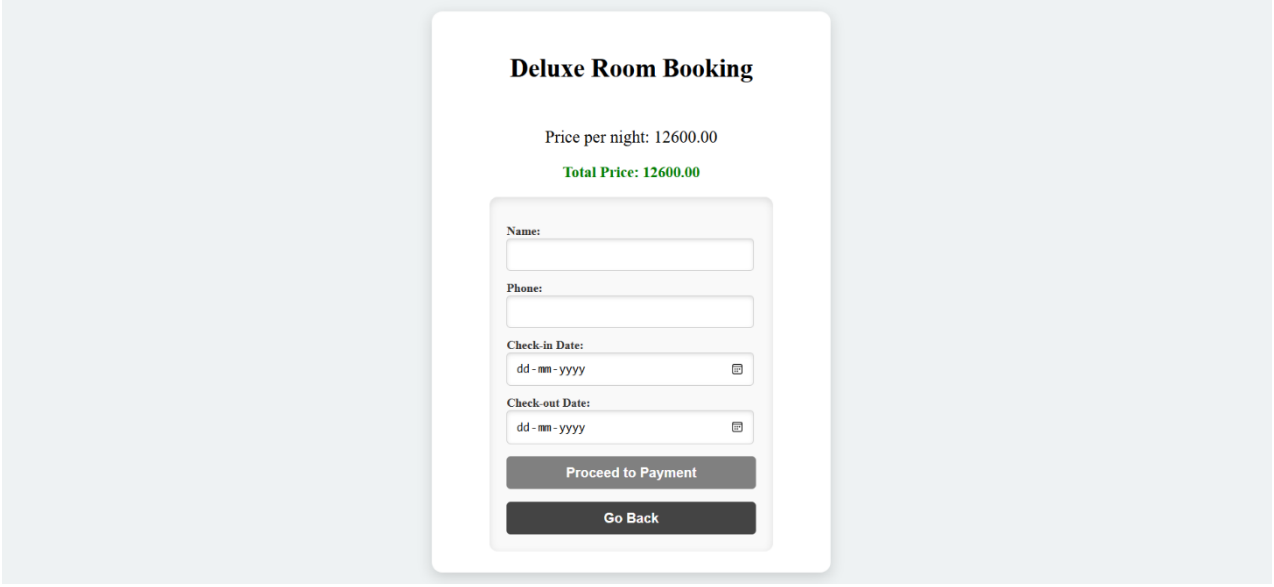

Figure-7: Room Booking

4.2.3 Banquet Hall booking

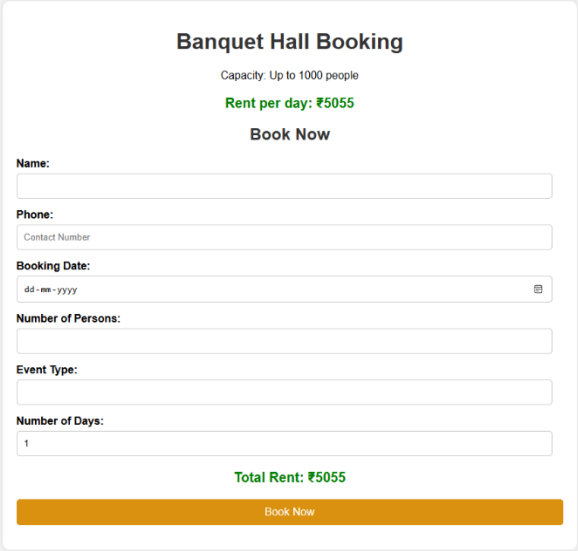

Figure-8: Banquet Hall Booking

4.2.4 Dining reservation

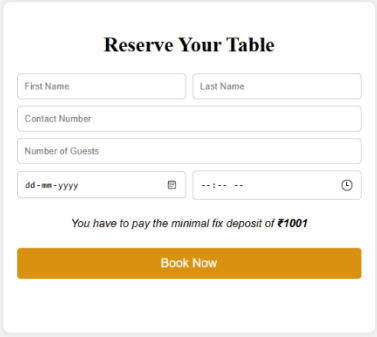

Figure-9: Dining Reservation

4.2.5 View Food Menu

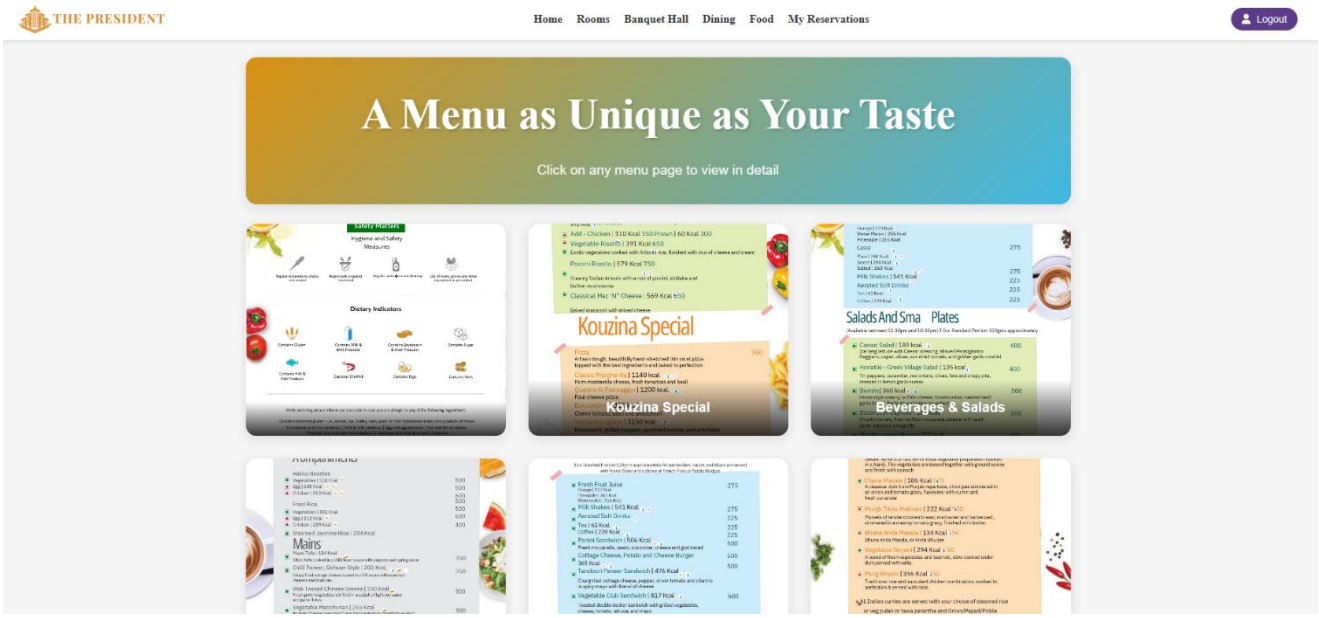

Figure-10: View Food Menu

4.2.6 Payment Interface

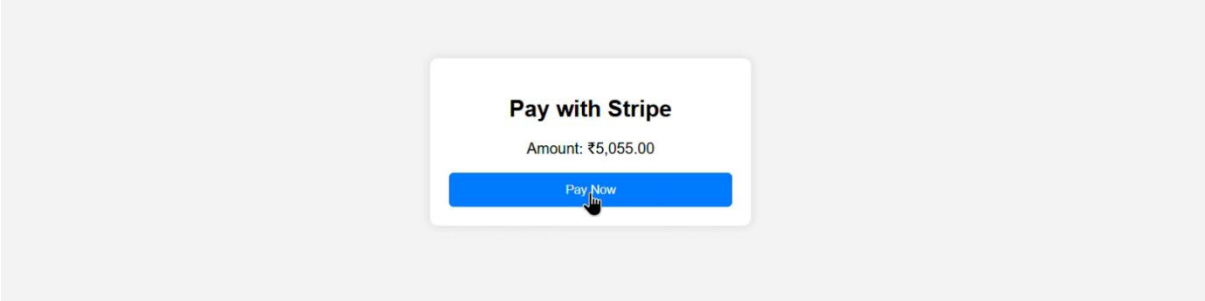

Figure-11: Payment Interface

4.2.7 Stripe Payment Interface

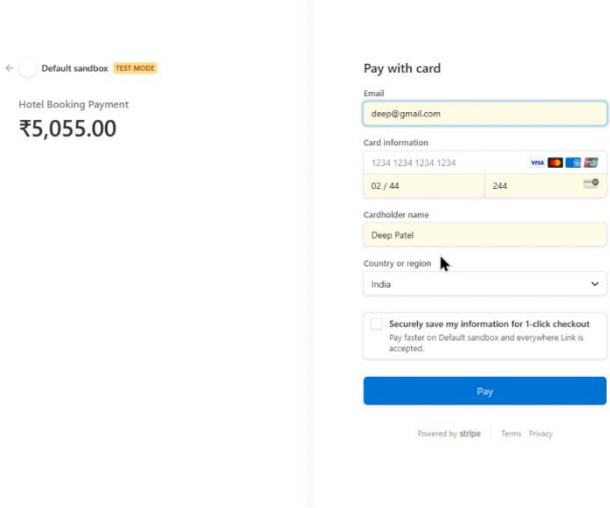

Figure-12: Stripe Payment Interface

4.2.8 QR-Code

Figure-13: QR-Code

4.2.9 My Reservation or Bookings

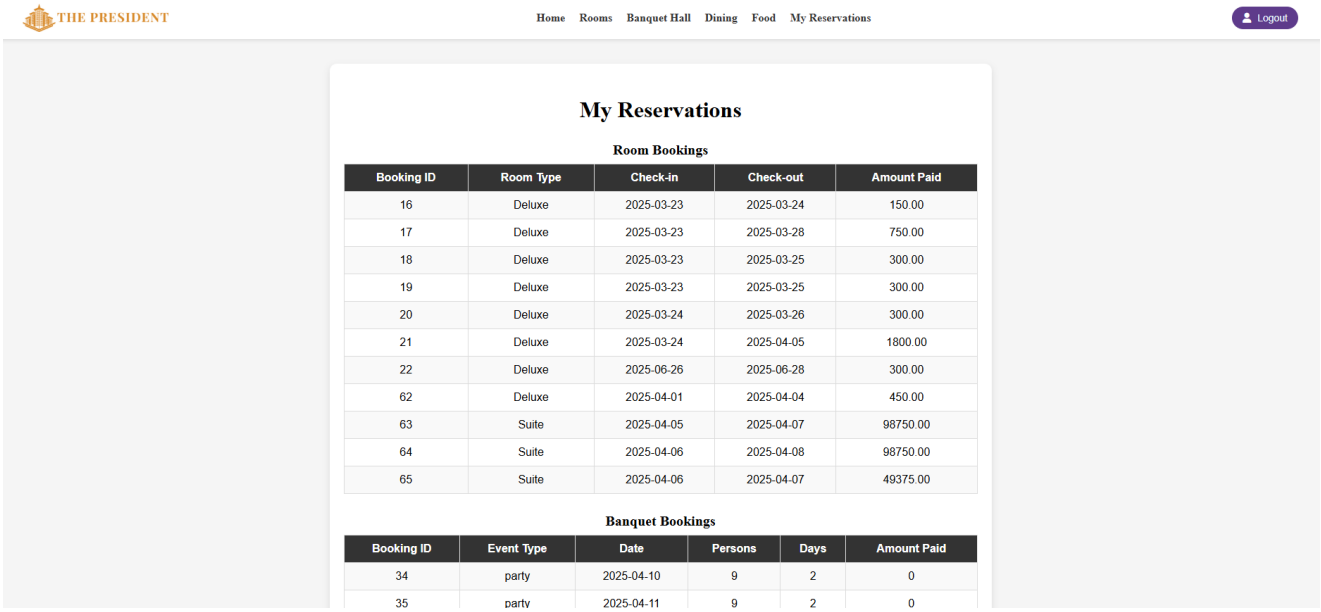

Figure-14: My Reservation

4.3 Admin side system

4.3.1 Admin Login

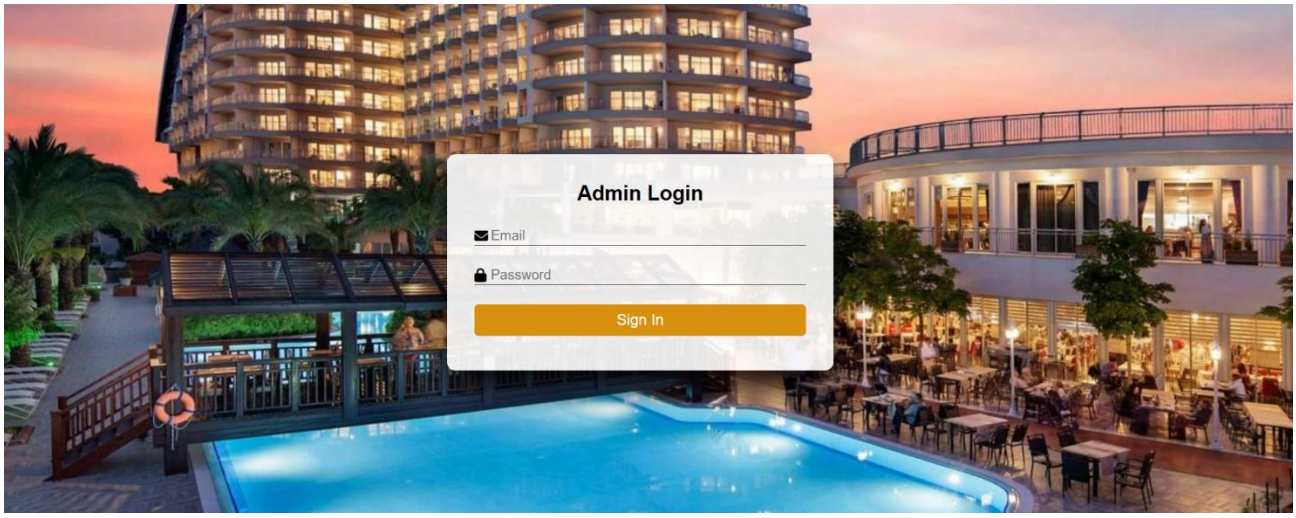

Figure-15: Admin Login

4.3.2 Bookings

Hotel Admin

Dashboard

Bookings

Users

Rooms

Banquet

Dining

Food Menu

Footer

Logout

Manage Bookings

Booking ID	Name	Email	Phone	Room Type	Check-in	Check-out	Price	Action
16	Deep Patel	deepatel0024@gmail.com	09913609357	Deluxe	2025-03-23	2025-03-24	150.00	Cancel
17	Deep Patel	deepatel0024@gmail.com	09913609357	Deluxe	2025-03-23	2025-03-28	750.00	Cancel
18	Deep Patel	deepatel0024@gmail.com	09913609357	Deluxe	2025-03-23	2025-03-25	300.00	Cancel
19	Deep Patel	deepatel0024@gmail.com	09913609357	Deluxe	2025-03-23	2025-03-25	300.00	Cancel
20	Deep Patel	deepatel0024@gmail.com	09913609357	Deluxe	2025-03-24	2025-03-26	300.00	Cancel
21	Deep Patel	deepatel0024@gmail.com	09913609357	Deluxe	2025-03-24	2025-04-05	1800.00	Cancel
22	Deep Patel	deepatel0024@gmail.com	09913609357	Deluxe	2025-06-26	2025-06-28	300.00	Cancel
51	Deep Patel	deep@gmail.com	09913609357	Suite	2025-04-01	2025-04-02	350.00	Cancel
52	Deep Patel	deep@gmail.com	09913609357	Suite	2025-04-08	2025-04-09	350.00	Cancel
53	Deep Patel	deep@gmail.com	09913609357	Suite	2025-04-08	2025-04-09	350.00	Cancel
54	Deep Patel	deep@gmail.com	09913609357	Suite	2025-04-08	2025-04-09	350.00	Cancel
55	Deep Patel	deep@gmail.com	09913609357	Suite	2025-04-09	2025-04-19	3500.00	Cancel
56	Deep Patel	deep@gmail.com	09913609357	Deluxe	2025-04-05	2025-04-06	150.00	Cancel
57	Deep Patel	deep@gmail.com	09913609357	Deluxe	2025-04-05	2025-04-06	150.00	Cancel
58	Deep Patel	deep@gmail.com	09913609357	Standard	2025-04-02	2025-04-04	200.00	Cancel

Figure-16: Bookings

4.3.3 Users

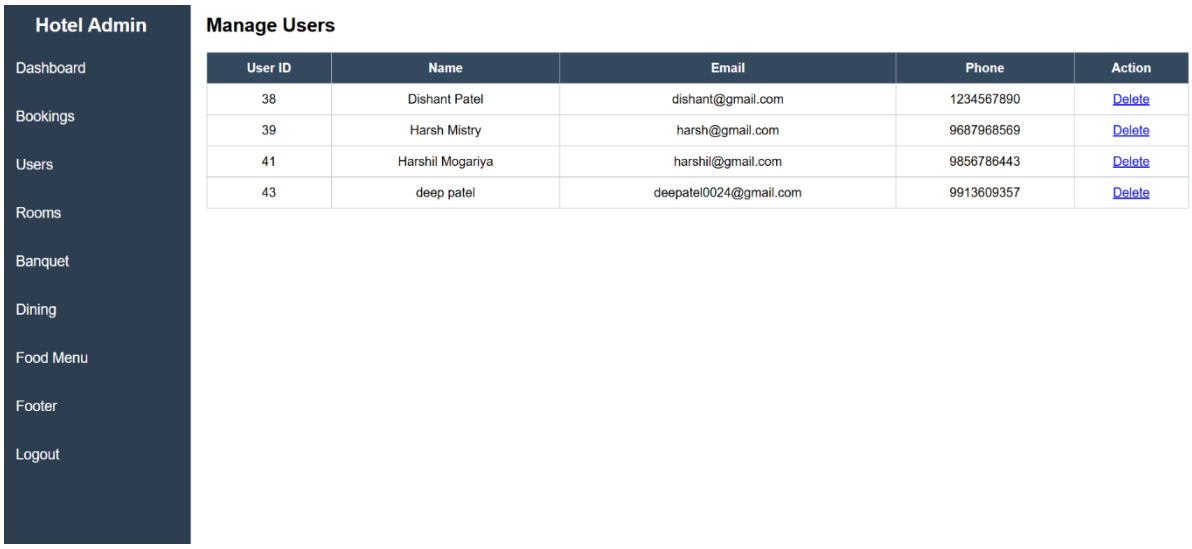

Figure-17: Users

4.3.4 Rooms

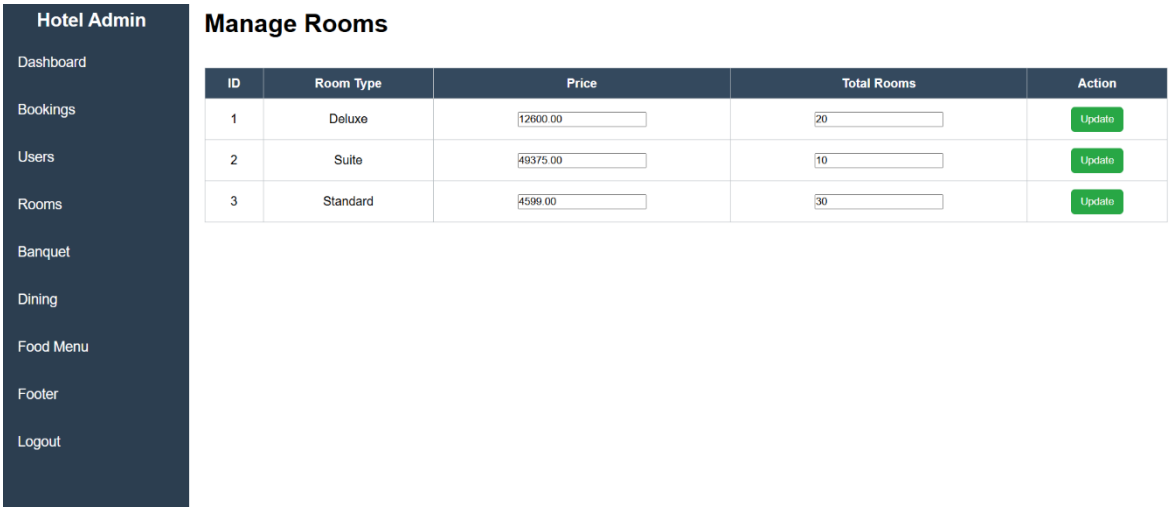

Figure-18: Rooms

4.3.5 Banquet

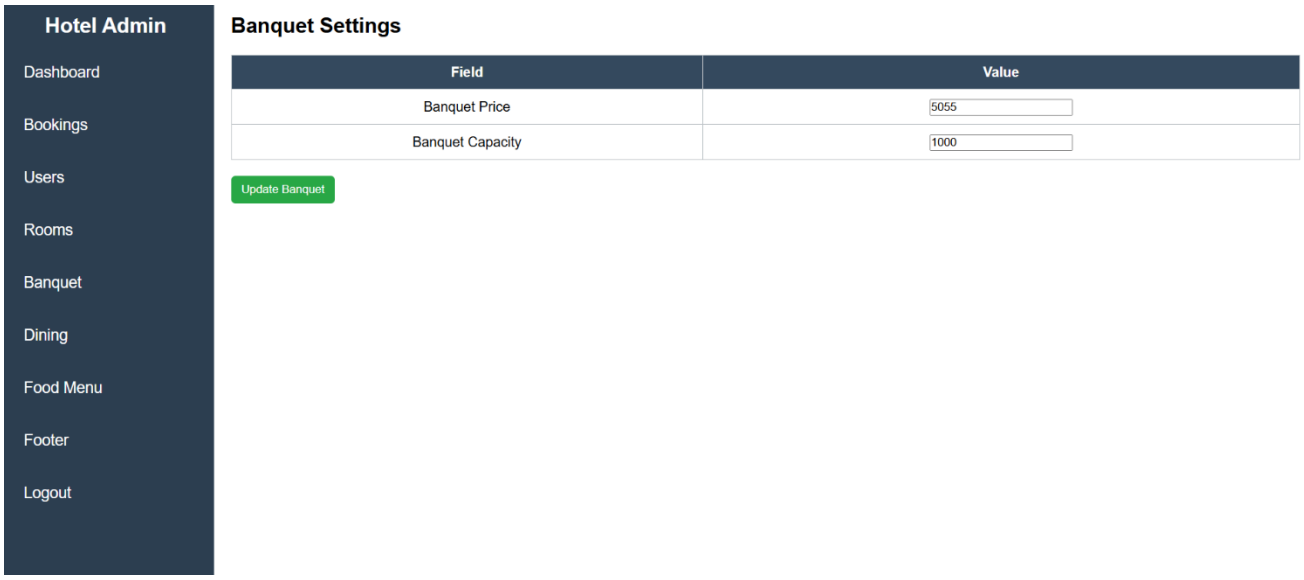

Figure-19: Banquet

4.3.6 Dining

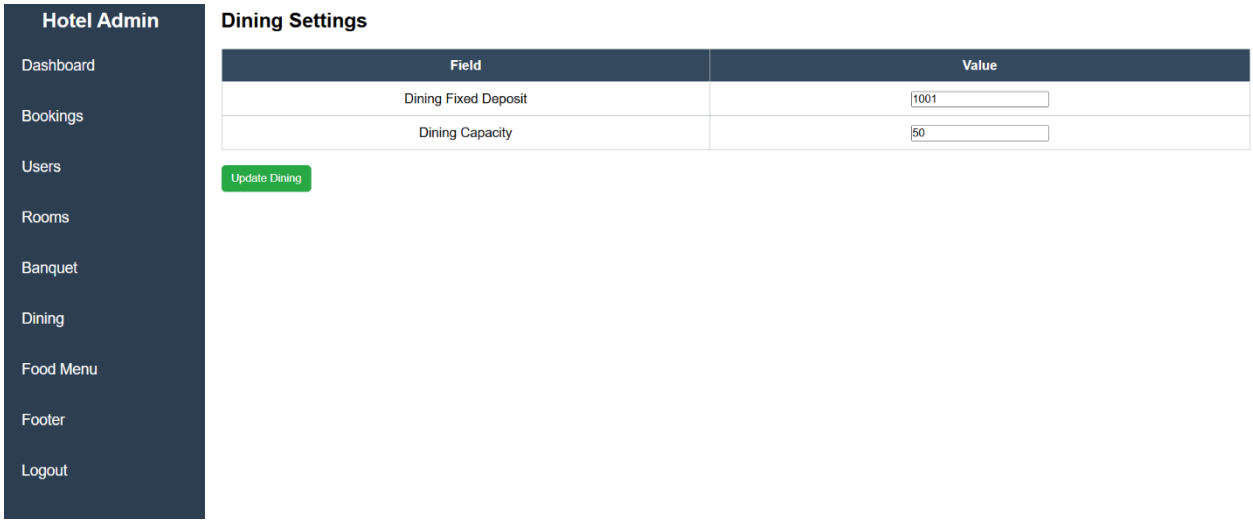

Figure-20: Dining

4.3.7 Food Menu

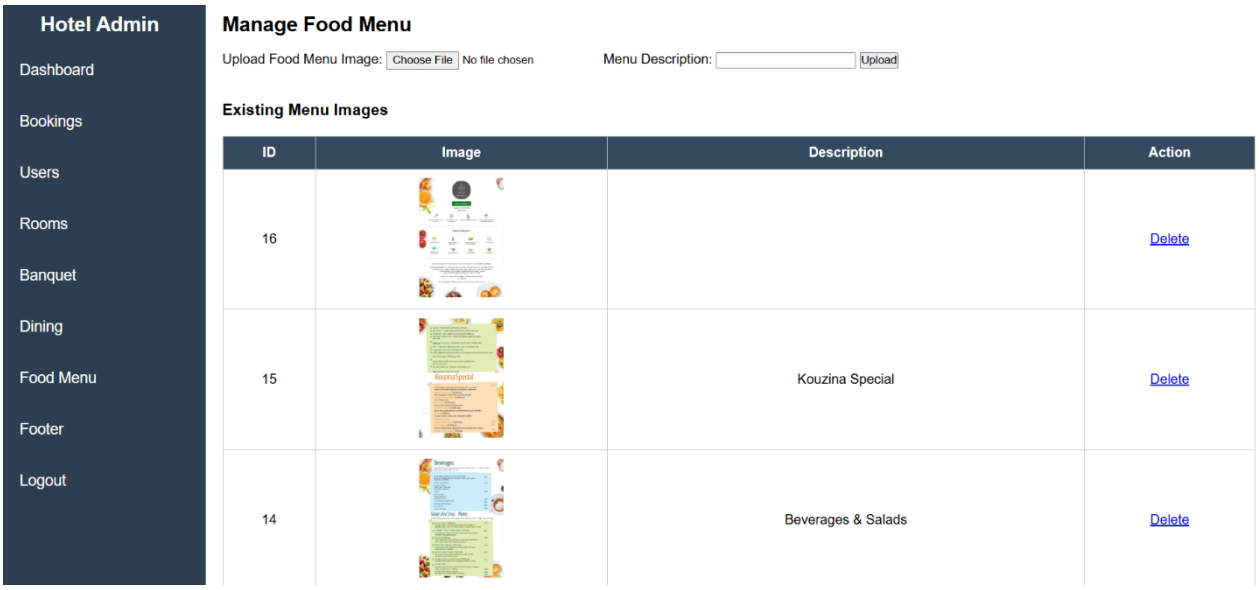

Figure-21: Food Menu

4.3.8 Footer

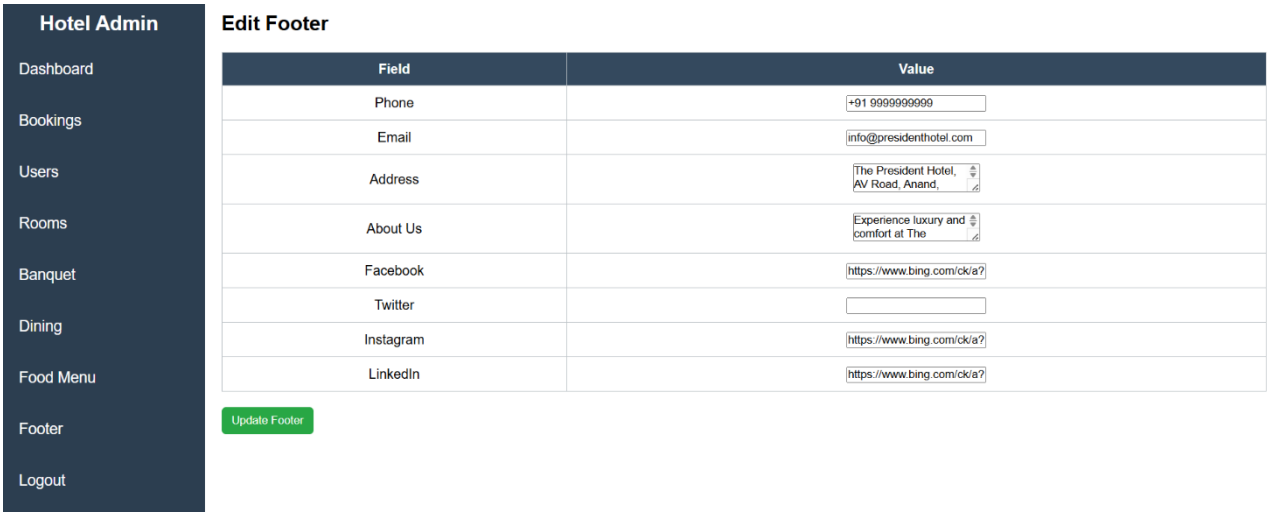

Figure-22: Footer

5. QR Code Functionality

One of the standout and innovative features integrated into this hotel management system is **QR code generation upon successful payment**. This feature plays a vital role in modernizing the check-in process and streamlining hotel operations.

How It Works

- Upon successful completion of a booking (e.g., room, banquet, or dining), and confirmation of payment (handled via Stripe), the system automatically:
    - Collects essential booking data (such as name, email, booking ID, type of room, check-in, and check-out dates, etc.).
    - Encodes this information into a QR code using a QR code generation library (e.g., PHP QR Code, or libraries like qrcode in JavaScript or Python).
    - The generated QR code is then:
        - Displayed on the confirmation page.
        - Downloaded automatically or sent via email (depending on implementation).
        - Stored in the system database for future reference.

Encoded Booking Details

For **room bookings**, the QR code typically contains:

- Name
- Email Address
- Booking ID
- Room Type
- Check-In Date
- Check-Out Date

Use Cases & Benefits

1. Contactless Check-In

- Guests can simply scan their QR code at a self-service kiosk or show it at the front desk.
- No need for manual form-filling or identity confirmation if already provided during booking.
- Enhances health safety, especially post-COVID.

2. Quick Retrieval of Booking Data

- Hotel staff can scan the QR code using a tablet or mobile device.
- The system instantly fetches and displays all associated booking information.
- Minimizes errors and speeds up the verification process.

3. Verification for Multiple Services

- Supports seamless transitions between different departments (reception, banquet hall, dining area).

4. Enhanced Customer Experience

- Reduces waiting time and manual entries.
- Makes the check-in process modern and tech-friendly.
- Builds trust with users by providing instant, digital proof of booking.

Technical Implementation Highlights

- **Backend (PHP or Node.js)** generates booking confirmation and triggers QR code creation.
- **Libraries Used:**
  - PHP: phpqrcode library
  - Node.js: qrcode NPM package
- **Output Format:** PNG or SVG
- **Storage/Delivery:** Shown to the user, optionally emailed, and/or stored in the database

Future Scope

- Integration with mobile apps for in-app QR code display.
- QR-based room access (smart locks).
- QR for loyalty program tracking or coupon redemption.

6. Discussion

The development of this Hotel Management System marks a significant step toward digital transformation in the hospitality sector. By addressing critical limitations in traditional hotel operations, such as manual reservation entries, inconsistent availability tracking, and delayed confirmation processes, the system introduces automation, transparency, and enhanced user experience.

Key Improvements:

- **Self-Service Capability:** Guests can independently check availability, make bookings, and complete payments, reducing the dependency on hotel staff and minimizing human errors.
- **Real-Time Operations:** Integration of AJAX-based availability checks and immediate payment confirmation through Stripe ensures that users receive instant feedback, improving customer satisfaction.
- **QR Code Verification:** The automatic generation of QR codes for each booking serves both as a digital receipt and a secure method of identification during check-in/check-out, streamlining front-desk procedures.
- **Admin Empowerment:** The dedicated admin panel provides complete control over operations including managing rooms, viewing bookings, setting dynamic pricing for rooms, banquet, and dining, manage users, change footer information, and add or remove food menu.

Scalability & Future Enhancements:

While the current system lays a strong foundation, several enhancements could further extend its usability and appeal:

- **Multilingual Support:** Incorporating multiple languages would cater to a global audience, especially useful for hotels in tourist-heavy regions.
- **Automated Email & SMS Notifications:** Adding transactional emails and SMS alerts (e.g., booking confirmations, reminders, cancellations) would improve communication and reduce no-shows.
- **Mobile App Integration:** A native mobile app or PWA (Progressive Web App) can make booking and check-in even more convenient for users on the go.
- **Advanced Reporting & Analytics:** Visual dashboards showing occupancy trends, revenue breakdowns, and customer demographics can help management make data-driven decisions.
- **Customer Reviews & Ratings:** A feedback system would help maintain service quality and improve trust.
- **AI-Based Dynamic Pricing:** Future iterations can include smart pricing models based on demand, availability, and seasonality.

7. Conclusion

The proposed **Hotel Booking and Management System** successfully achieves its goal of digitizing and streamlining hotel operations. By integrating modern technologies such as **HTML**, **CSS**, **JavaScript**, **PHP**, **MySQL**, and third-party APIs like **Stripe** and **phpqrcode**, the system delivers a complete solution that is both functional and user-friendly.

Core Achievements:

- Seamless **room, banquet, and dining reservation system** with real-time availability.
- Secure **payment processing via Stripe**, with immediate booking confirmation.
- Automatic **QR code generation** for verification, adding security and convenience to the customer journey.
- A robust **admin panel** allowing full control over bookings, room types, pricing, and availability.
- Clean and responsive design accessible across devices, ensuring usability for a wide range of users.

By automating repetitive tasks and centralizing critical operations, this system not only boosts staff productivity but also enhances the overall guest experience. The project demonstrates how web technologies can be leveraged to modernize hospitality services, especially in a post-COVID world where contactless operations are becoming the norm.

8. References

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