UNIVERSITY OF BARISHAL

Department of Computer Science & Engineering

WEB ENGINEERING LAB PROJECT PROPOSAL

Course: CSE-2210 (Web Engineering Lab)

Project: Guest House Reservation Management System

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1. Project Title

Guest House Reservation Management System

2. Introduction

In many guest house facilities, reservation activities are still managed through manual processes such as phone calls, paper registers, and basic spreadsheets. These practices are inefficient and frequently lead to inaccurate availability information, booking conflicts, and administrative delays.

This proposal presents a **Guest House Reservation Management System**—a full-stack web application intended to support guest house operations across multiple locations (initially **Dhaka** and **Barishal**). The system will enable date-wise availability checking, rule-based booking for shared accommodations (including gender constraints), secure authentication, and online payment processing. In addition, a management interface will provide structured oversight of occupancy, bookings, and revenue.

3. Main Theme of the Project

A structured reservation platform that supports role-based operations and secure online transactions.

Key pillars

Booking management: Date-wise and location-wise search with conflict-free room/bed allocation under shared-room gender rules

Operations & management: Centralized monitoring of occupancy, bookings, and revenue

Security & scalability: Secure authentication, Stripe-based payment processing, and a scalable system architecture

4. Problem Statement

Existing manual methods and limited online systems commonly exhibit the following limitations:

- Availability information is not updated in real time, reducing reliability for users
- Shared-room allocation policies, particularly gender-based constraints, are not consistently enforced

- Booking conflicts occur due to the absence of proper validation and concurrency control
- Payment handling is often external to the booking workflow, creating security and accountability concerns
- Managers lack a centralized dashboard for operational monitoring and analysis

Accordingly, there is a clear need for an integrated platform that ensures accurate availability, policy-compliant allocation, secure payments, and role-based administrative control.

5. Objectives

1. Develop a secure full-stack reservation management platform
2. Implement role-based authentication and authorization for **Users (Guests)** and **Managers**
3. Provide date-wise availability checking for rooms and beds
4. Enforce gender-specific constraints for shared accommodations during the booking process

5. Integrate **Stripe** to support secure online payment processing
6. Provide managerial dashboards for occupancy monitoring and revenue tracking
7. Ensure a responsive user interface across mobile and desktop devices

6. Scope of the Project

A. Web-based application accessible via modern browsers
B. Multiple guest house locations (Dhaka & Barishal)
C. Single and shared room types
D. Online booking with Stripe payment integration
E. Role-based access (User & Manager)
F. Manager dashboards for occupancy, bookings, and revenue analysis
G. Fully responsive and modern UI/UX

7. Methodology

The project will follow the **Agile Software Development Life Cycle (SDLC)**:

1. **Requirement Analysis:** Identify user needs, features, and constraints

2. **System Design:** UI wireframes, database schema, and system architecture
3. **Implementation:**
   - **Frontend:** React.js + Tailwind CSS
   - **Backend:** Node.js + Express.js (modular pattern)
   - **Authentication:** Firebase Authentication
   - **Payments:** Stripe integration
4. **Testing:** Booking validation, payment flow testing, functional testing, and responsive UI testing
5. **Deployment:** Neon DB (PostgreSQL) hosting and secure environment configuration
6. **Maintenance:** Optimization, performance improvements, and bug fixes

8. System Overview / User Roles

A. User (Guest)

✓ Register and log in via Firebase
✓ Search rooms and beds by location and date
✓ Book with gender-specific validation for shared rooms
✓ Pay securely through Stripe
✓ View booking history

B.**Manager**

- ✓ Add, update, and delete rooms and beds
- ✓ Monitor bookings, occupancy, and revenue
- ✓ Enforce gender-specific rules for shared rooms
- ✓ Manage and verify user accounts

9. Technology Stack

Frontend

- ➢ React.js
- ➢ Tailwind CSS
- ➢ React Router
- ➢ React Hook Form
- ➢ Framer Motion

Backend & Integrations

- ➢ Node.js + Express.js
- ➢ Firebase Authentication
- ➢ Stripe Payment Integration
- ➢ Neon DB (PostgreSQL)
- ➢ Axios

Development Tools

- VS Code

- GitHub

10. Key Features

I. Role-based dashboards with protected routes
II. Real-time room and bed availability
III. Gender-aware shared-room booking rules
IV. Secure Stripe payments
V. Manager analytics for occupancy and revenue
VI. Responsive interface with smooth UX and animations

11. Real-World Applications

I. Small to medium guest houses
II. Hostel and dormitory management
III. Student housing services
IV. Tourism accommodations
V. Scalable multi-location accommodation management with secure online payments

12. Conclusion

The proposed **Guest House Reservation Management System** aims to establish a reliable and secure reservation workflow for guests while strengthening managerial control over daily operations. By integrating authentication, policy-

compliant allocation (including gender constraints for shared rooms), and Stripe-based payment processing within a single platform, the project demonstrates the practical application of full-stack development, secure third-party integration, responsive interface design, and data-driven operational monitoring.