**Smart Parking Lot Management System**

**Product Brochure**

**Project Title:** Smart Parking Lot Management System

**Team Members:** Mustapha Ibrahim

**Key Features:**

* **Real-time Parking Availability** – Users can check open spots in real-time.
* **Online Booking System** – Drivers can reserve parking spaces in advance.
* **Automated Entry/Exit System** – QR code-based access for seamless parking.
* **Payment Integration** – Secure digital payments for bookings.
* **Admin Dashboard** – Manage parking slots, track usage, and generate reports.

**System Requirements:**

* **Hardware:** Internet-enabled device (PC, tablet, or smartphone).
* **Software:** Browser with JavaScript support, PostgreSQL for database.
* **Hosting:** Cloud-based deployment (AWS/Heroku recommended).

**Architecture Overview:**

* **Frontend:** React.js (User interface)
* **Backend:** Flask/Django (Handles business logic and API calls)
* **Database:** PostgreSQL (Stores user and parking slot data)
* **Authentication:** JWT-based authentication
* **Payment Gateway:** Stripe/PayPal integration

**System Requirements Documentation**

**1. Cover Page** **Project Name:** Smart Parking Lot Management System  
**Author:** Mustapha Ibrahim

**2. Table of Contents**

1. Problem Statement & System Requirements
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**3. Problem Statement & System Requirements** Traffic congestion in urban areas is worsened by inefficient parking management. The **Smart Parking Lot Management System** aims to improve parking efficiency by providing real-time availability tracking, reservation, and automated access.

**Functional Requirements:**

* User registration & authentication.
* Parking slot tracking and reservations.
* Online payment integration.
* Admin dashboard for monitoring usage.

**4. System Sequence Diagram:**

A diagram of payment process

AI-generated content may be incorrect.

**5. Activity Diagram:**

A screenshot of a flowchart

AI-generated content may be incorrect.

**6. User Interface Specification:**

* Home Page: Displays available parking spots.
* Booking Page: Allows users to reserve a spot.
* Payment Page: Secure checkout for reservations.
* Admin Dashboard: Management of parking slots.
* **7. Project Plan:**

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Task** | **Completion Date** |
| Week 1-2 | UI/UX Design | Completed |
| Week 3-4 | Backend API Development | Completed |
| Week 5-6 | Payment Gateway Integration | In Progress |
| Week 7-8 | Testing & Deployment | Pending |

### **8. References:**

1. **IEEE Smart Parking Systems:**
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2. **React.js Official Documentation:**
   * Meta. (2024). *React – A JavaScript library for building user interfaces.* Retrieved from <https://react.dev/>
3. **Django Official Documentation:**
   * Django Software Foundation. (2024). *Django Web Framework Documentation.* Retrieved from <https://docs.djangoproject.com/>
4. **Flask Official Documentation:**
   * Pallet Projects. (2024). *Flask: The Python Microframework.* Retrieved from https://flask.palletsprojects.com/
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**9. Highlighted Changes:**

* Improved user authentication security.
* Added payment gateway integration.

**Midterm Presentation Slides Outline**

1. **Introduction** 
   * Project title & purpose
   * Target audience
   * Key problem it solves
2. **Live System Demonstration** 
   * Showcasing user registration & login
   * Booking a parking spot
   * Real-time availability tracking
   * Payment & checkout process
   * Admin dashboard features
3. **Future Plans (1-2 min)**
   * Completing payment integration
   * Improving UI responsiveness
   * Implementing machine learning for demand forecasting  
       
     To conclude, the Smart Parking Lot Management System offers a seamless and efficient solution to urban parking challenges by leveraging real-time tracking, automated entry/exit, and secure payment integration, while providing robust management tools for administrators to optimize parking resources. To conclude, the Smart Parking Lot Management System offers a seamless and efficient solution to urban parking challenges by leveraging real-time tracking, automated entry/exit, and secure payment integration, while providing robust management tools for administrators to optimize parking resources.