Title: High-Level Design Document Cycle Parking System.

Author : Mohamed Akthar K

Sections:

1.1 Introduction

Purpose: Learn to manage cycle parking within an area of 24,000 sq ft efficiently, assure availability, ease of entry/exit and real-time control.

Scope: Design: Multi-row layout, entry/exit management, software system to monitor slot availability and notifications and user assignment.

Audience: Developers, stakeholders and QA team.

1.2 System Overview

- 6-row parking areas, defined crossing, entrance and exit gates.
- User/admin availability management system.
- On-the-fly control by sensors per row.
- Full parking or assignments notifications.

1.3 High Level Design(HLD) Diagram.

Add Parking Layout and Software Prototype Diagrams.

Explain Components: -

- **Parking Zone:** Rows and pathways.
- **Entry/Exit Gate:** Automatic recognition.
- **Availability Check:** Real-time occupancy monitoring.

- **User Interface:** Slot request and status display.
- **Notification System:** Alerts and updates.

1.4 UML Diagrams

- Class Diagram- classes such as Cycle, ParkingRow, User, Sensor, Notification.
- Sequence Diagram: slot request flow: user request: request slot: assign slot: confirm.

1.5 Technical Architecture

- Front-End: React/Angular (not needed to demonstrate).
- Back-End: Slots and sensor Java/Node.js REST APIs.
- Database: MySQL/PostgreSQL- User, ParkingSlots, SensorData and Assignments table.
- Notifications: SMS/ email integration.

1.6 References

❖ Draw.io for diagrams URL Link:- (https://viewer.diagrams.net/?tags=%7B%7Dclightbox=1Chighlight=0000ffCedit=_blankClayers=1Cnav=1Cdark=auto#G1xgUNrvk2L_7uXfzsGDCUzE-AZNm5alv7)