

**REQUIREMENT SPECIFICATION DOCUMENT**

**CAR PARKING MANAGEMENT SYSTEM FOR SM MALL OF ASIA**

A Requirement Specification Document Presented to the

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# **REQUIREMENT SPECIFICATION**

## **INTRODUCTION**

The purpose of this document is to describe in detail the requirements for the Parking Management System (PMS) that will be developed for SM Mall of Asia. This document serves as a guide for the developers, testers, project stakeholders, and the client to ensure that the system meets the intended objectives. By clearly stating all the requirements, this document will make sure that everyone involved understands what the system is supposed to do, that the development team follows the same project goals, and that the client can verify that the system aligns with their needs. It also minimizes the possibility of misunderstandings and ensures that the project stays on track throughout the stages of design, development, testing, and deployment.

### **Overview**

The Car Parking Management System is a locally hosted application designed to automate and simplify the parking operations of SM Mall of Asia. At present, parking management is handled manually, where attendants record vehicle details on paper tickets. This often results in delays, long queues, and possible loss of documents, which negatively affects customer satisfaction. The PMS aims to solve these issues by allowing attendants to register cars digitally, calculate parking charges automatically, and monitor available spaces in real time. The system will keep all records in a centralized database, which will make it easier to search, sort, and generate reports.

The system is designed to provide a user-friendly interface that can be used by parking attendants and administrators with only basic computer skills. Since it will run on the mall's local network, it will not require internet access and will continue to function even during connectivity issues, ensuring uninterrupted operations. The main goal of the project is to modernize the parking system in a reliable and cost-effective way by reducing paperwork, preventing data loss, and improving accuracy. In addition, the system will generate valuable reports such as daily vehicle collections, which will help mall management make better operational decisions. Ultimately, this project will not only

improve mall operations but also increase customer satisfaction by reducing waiting time, minimizing errors, and making the entire parking process more organized.

### **Scope of the Requirements Specification**

This document lists both functional requirements and non-functional requirements. It also explains use cases, data requirements, and any assumptions or limitations. The goal is to provide a full picture of what the system should achieve without yet going into programming details.

## FUNCTIONAL REQUIREMENTS

The system will have the following important features. Each requirement has a unique ID, a description, and conditions for success:

ID	REQUIREMENT	PRIORITY	DEPENDENCIES	ACCEPTANCE
FR - 01	Provide secure login for staff and admin users.	High	User table	Only registered users can log in; invalid users are denied access.
FR - 02	Allow attendants to register incoming vehicles.	High	Vehicle table	Vehicle details saved successfully in database.
FR - 03	Automatically calculate parking duration and fees.	High	Vehicle entry/exit times	Correct fee is displayed when vehicle exits.
FR - 04	Maintain real-time monitoring of available parking slots.	High	Parking slot table	Dashboard updates slot availability instantly.
FR - 05	Allow admin to generate summary reports of parking activities.	Medium	Vehicle and transaction tables	Reports show daily collections, total parked vehicles, and duration.
FR - 06	Provide an admin dashboard to supervise logs and operations.	High	All modules	Admin can view vehicle logs, fees, and reports in one place.

*Table 1. Functional Requirements for Parking Management System*

## NON-FUNCTIONAL REQUIREMENTS

🕒 **Performance:**

- The system must handle multiple staff using it at the same time without slowing down.

🕒 **Usability:**

- The system must be easy for staff with basic computer skills.
- The interface should be simple, with clear labels and buttons.
- Navigation should require no more than 2 clicks to perform common tasks.

🕒 **Reliability:**

- The system should run continuously during business hours.
- Automatic backups must prevent data loss if the system crashes.

🕒 **Security:**

- Only staff and admin can log in.
- Admin has more privileges than staff.
- Passwords stored securely (not plain text).

🕒 **Scalability:**

- The system should allow more tables to be added easily if the restaurant expands.
- The database should be able to handle growing dining history records.

🕒 **Maintainability:**

- The developers will provide 3 months of free maintenance.

- o The system should allow easy updates for bug fixes and small improvements.
- ⌚ **Scalability** – The system should be able to handle growth, like when there are more tenants, contracts, invoices, and payments over time, without slowing down.
- ⌚ **Maintainability** – The system should be easy to update in the future, with clear documentation for fixes or improvements.

## USE CASE DIAGRAM

# Parking Management System - Use Case Diagram

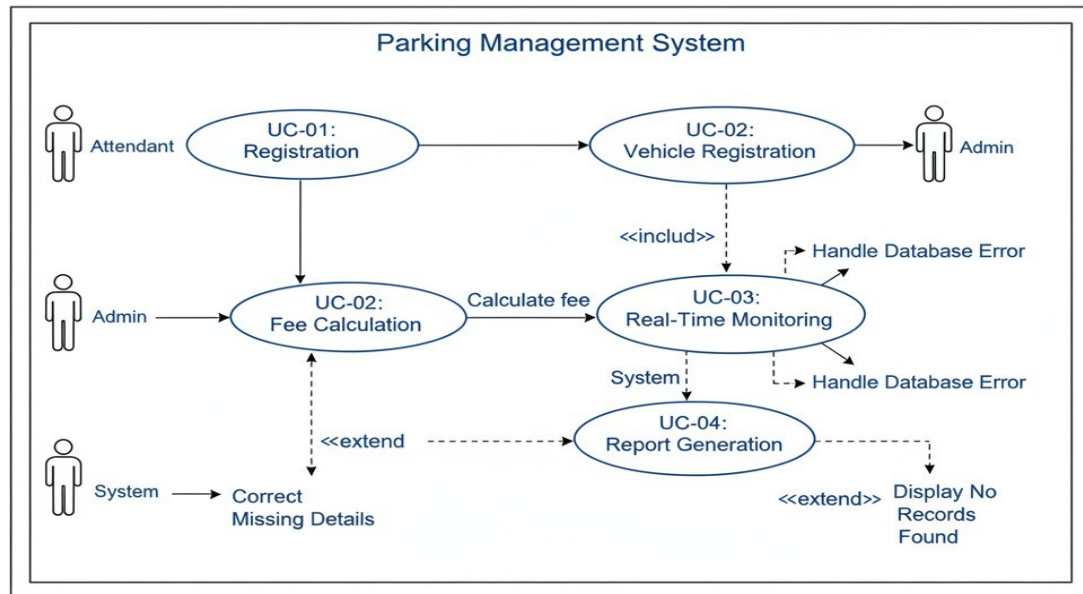


Figure 1. Use Case Diagram of Parking Management System



<b>Use Case ID</b>	UC-01
<b>Use Case Name</b>	Vehicle Registration
<b>Description</b>	Attendant records a vehicle's details when it enters the parking lot.
<b>Actor(s)</b>	Attendant
<b>Pre-conditions</b>	Attendant must be logged in.
<b>Post-conditions</b>	Vehicle details are stored in the database.
<b>Alternate Flows</b>	<div>If details are missing, the system prompts the attendant to correct them..</div>

*Table 2. Vehicle Registration Descriptions*

<b>Use Case ID</b>	UC-02
<b>Use Case Name</b>	Fee Calculation
<b>Description</b>	The system automatically calculates the parking fee based on duration.
<b>Actor(s)</b>	Attendant
<b>Pre-conditions</b>	Vehicle must already be registered.
<b>Post-conditions</b>	Correct fee is displayed and recorded.
<b>Alternate Flows</b>	If exit time is missing, the system prompts the attendant to input it.

*Table 3. Fee Calculation Descriptions*

<b>Use Case ID</b>	UC-03
<b>Use Case Name</b>	Real-Time Monitoring
<b>Description</b>	Admin monitors available and occupied parking slots in real time.
<b>Actor(s)</b>	Admin
<b>Pre-conditions</b>	The system must be running.
<b>Post-conditions</b>	Dashboard shows accurate slot availability.
<b>Alternate Flows</b>	If a database error occurs, the system shows an error message.

*Table 4. Real Time Monitoring Descriptions*

<b>Use Case ID</b>	UC-04
<b>Use Case Name</b>	Report Generation
<b>Description</b>	Admin generates reports of parking activities (daily, weekly, monthly).
<b>Actor(s)</b>	Admin
<b>Pre-conditions</b>	Parking data must be available in the system.
<b>Post-conditions</b>	Reports display total vehicles, collections, and durations.
<b>Alternate Flows</b>	If no data exists, the report displays “No records found.”

*Table 5. Report Generation Descriptions*

## **Data Requirements**

### **Data Entities and Attributes**

1. **Vehicle:** VehicleID, Name, Mobile, VehicleNo, EntryDate, ExitDate, CreatedAt, UpdatedAt
2. **Parking Slot:** SlotID, Status
3. **User:** UserID, Username, Password, Create At
4. **Transaction:** TransactionID, VehicleID, Duration, FeeAmount, Date

## Relationships

- ⌚ **Vehicle–Transaction** - shows how a single car can come and go from the parking facility many times. Each time it parks, a new record is created in the Transaction table, linked back to that specific vehicle through its VehicleID. This makes it easy to see a complete history of where, when, and how long a car stayed.
- ⌚ **User–Transaction** - reflects how parking attendants or administrators handle multiple vehicles throughout their shift. Every transaction is tied to the UserID of the person who processed it, so the system can clearly show who handled each entry or exit. This not only helps with accountability but also makes performance tracking much simpler.
- ⌚ **Parking Slot–Vehicle** – works a bit differently. At any single moment, a slot can only have one car parked in it—but over time, that same slot will serve many different vehicles. By linking the SlotID to a vehicle when it's parked, the system can show in real time which slots are occupied and which ones are free, keeping parking organized and easy to manage.

## Assumptions and Constraints

### Assumptions

The development of the Car Parking Management System is based on several assumptions. It is assumed that SM Mall of Asia will provide all necessary information regarding pricing policies, parking procedures, and reporting requirements before development begins. It is also assumed that staff and administrators who will operate the system possess basic computer skills and will attend training sessions to learn the system. Additionally, it is assumed that the mall will use its existing local network and computers without requiring significant hardware upgrades.

## **Constraints**

The system must be developed using free or open-source software such as PHP, MySQL, and Apache. The system will not include advanced automation features such as camera-based slot detection, RFID systems, or mobile applications in its initial version. Hardware installations such as ticket dispensers, barriers, or biometric systems are also excluded. Time and budget limitations may also affect the pace of development, especially if there are delays in receiving operational details or feedback from the client during the development and testing phases.

## GLOSSARY

**Administrator.** A user with full access to the system, including viewing logs, generating reports, and supervising parking operations.

**Attendant.** A staff member who registers vehicles, calculates fees, and manages parking slots.

**Parking Slot.** An individual space in the parking area that can either be available or occupied.

**Transaction.** A record of the financial details of a parking session, including duration and fees charged.

**Dashboard.** The main interface for administrators to oversee parking operations and reports.