

# MINI CASE STUDY

## Finding a suitable parking space for a vehicle in a parking arena

### Software Requirements Specification

#### TEAM - INNOVATIVE DESIGNERS

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1.0	21-SEPT-2021	Innovative Designers	SRS

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## 1 INTRODUCTION

### 1.1 Identification

This Document shall be identified SRS/TEAM- Innovative Designers/1.0.

### 1.2 Purpose

This document, referred to as the 'Software Requirement Specifications', outlines the requirements for the proposed MINI CASE STUDY MODULES. The purpose of the document is to collect and analyze all assorted ideas that have come up to define the system, its requirements with respect to consumers. Also, we shall predict and sort out how we hope this product will be used in order to gain a better understanding of the project, outline concepts that may be developed later, and document ideas that are being considered, but may be discarded as the product develops.

### 1.3 Intended Audience

The intended audience for the case are the drivers who come to park their vehicles in the parking arena and the parking management system.

### 1.4 Proposed Mini Case Study Statement

The manual searching for a parking space always results in a wastage of time and fuel.

This problem is predominant in the urban areas. The mini case study aims at finding the best slot for parking a vehicle within a short span of time aided with technology.

### 1.5 Benefits of the system

Stakeholders (or) Beneficiaries identified :

- Driver
- Parking Management

### 1.6 Proposed Case Study Overview

#### 1.6.1 Key Modules

CODE	Key Modules	Purpose	Use Cases	Actors
A	Registration (or) Login and User Input	To record the details of the driver and to provide membership ID, To modify user profile and to choose the vehicle details	Login, Verify credentials, Display Login error, Update user profile, Insert new vehicle details, Delete old vehicle details,	Driver, Server, DB Admin

		(including insertion and deletion of vehicle details)	Select vehicle details	
B	Finding suitable parking spot	To find a suitable spot for parking the selected vehicle	Check free space for the vehicle, Lock a spot, Optimise route from entry, Display details of locked spot, Update occupancy details	Driver, Server, IoT Module, DB Admin
C	Aid for car parking	To help in navigating to the slot and to help in car positioning	Show navigation to slot, Confirm correct position, Change the parked status	Driver, IoT Module, Server
D	Payment	To pay parking fees	Make payment, Generate Bill	Driver, Server, DB Admin

### 1.6.2 Dependencies with other modules

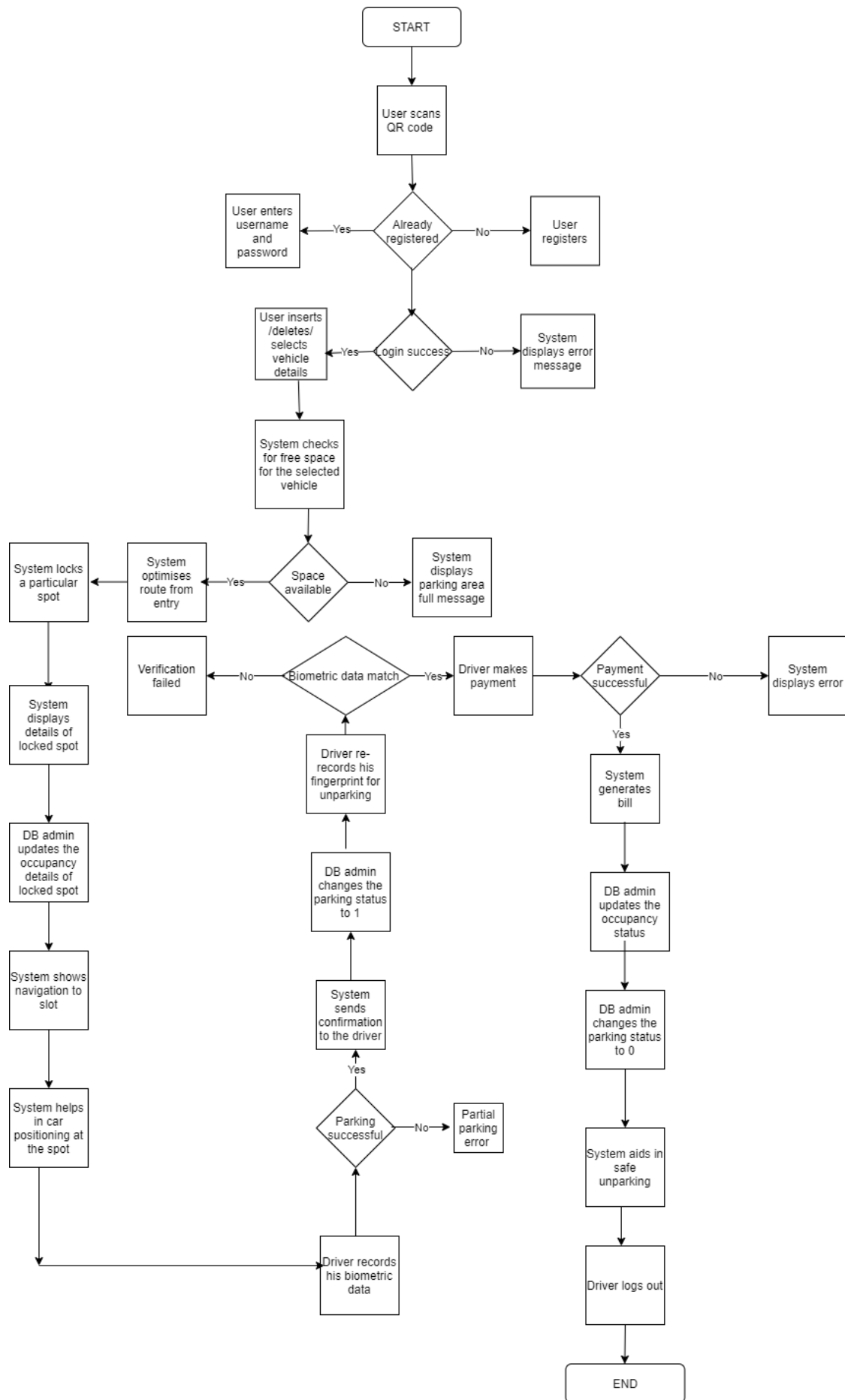
- Interface with payment processing system
  - With payment processing system for credit card payments
  - With UPI management app for UPI payments
  - With net banking portal of the listed banks for net banking payments

### 1.7 Scope

Primarily, the scope pertains to the parking arena where the vehicle has to be given a suitable parking space within a short span of time. It focuses on the parking management, the stakeholders and module which helps in computing the shortest path for the vehicle to reach the slot. The details of the vehicle owner or the driver will be populated from the login.

### 1.8 Process Flow

#### Flow Chart



### **1.8.1 Process Description :**

#### **1.8.1.1 Key fields :**

1. Membership ID
2. Name of the Driver
3. Username
4. Password
5. Vehicle Number
6. Vehicle type
7. Parking slot ID
8. Sensor ID
9. Parked status
10. Finger print of the driver
11. Date of parking
12. Parking time
13. Unparking time
14. Transaction ID
15. Payment mode
16. Invoice ID

#### **1.8.1.2 Functional specifications :**

- Login screen : User inputs username and password followed by authentication using DB
- Registration screen : User registers with username and password
- Vehicle Selection screen :
  - User selects vehicle details from his previous visits
  - Shows the details of vehicle parked after parking
  - Logout feature
- Update profile :
  - User can change his personal details
  - Insert new vehicle details
  - Delete old vehicle details
  - Logout feature
- Navigation screen :
  - Displays the details of slot booked
  - Shows navigation from current location till the driver parks his vehicle
  - Shows directions for unparking
- Parking confirmation screen : Displays message for successful parking or error message for partial parking
- Payment screen :
  - Shows payment methods
  - Navigates to payment processing screen depending on the mode chosen
  - Displays bill generated
- Unparking confirmation : After user re-records his finger print successfully, confirmation message sent

## **1.9 Dependencies with other modules**

### **1.9.1 Dependent processes**

<b>Sl.No</b>	<b>Process Name</b>	<b>Remarks</b>
1	Payment of parking fee	Depends on the payment authorization module
2	Fingerprint recognition	Depends on the biometric device

### **1.10 Report**

The report generated by the system is the bill generated after successful payment by the driver after he takes his vehicle from the parking slot.

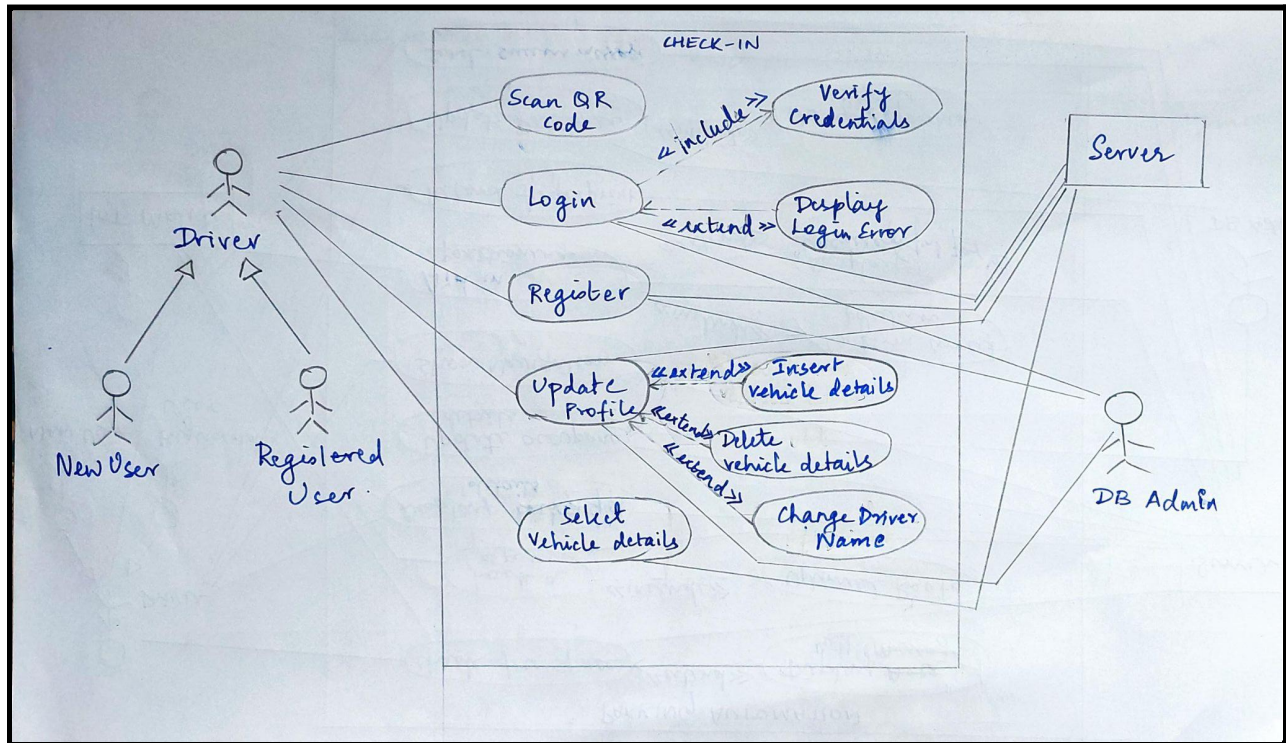
### **1.11 Dynamic Requirements**

When the car is parked correctly at the slot, the number plate of the car will be read using the computer vision module (fixed close to the sensor). The vehicle number will be matched with the one entered by the driver. This is done to enhance security.

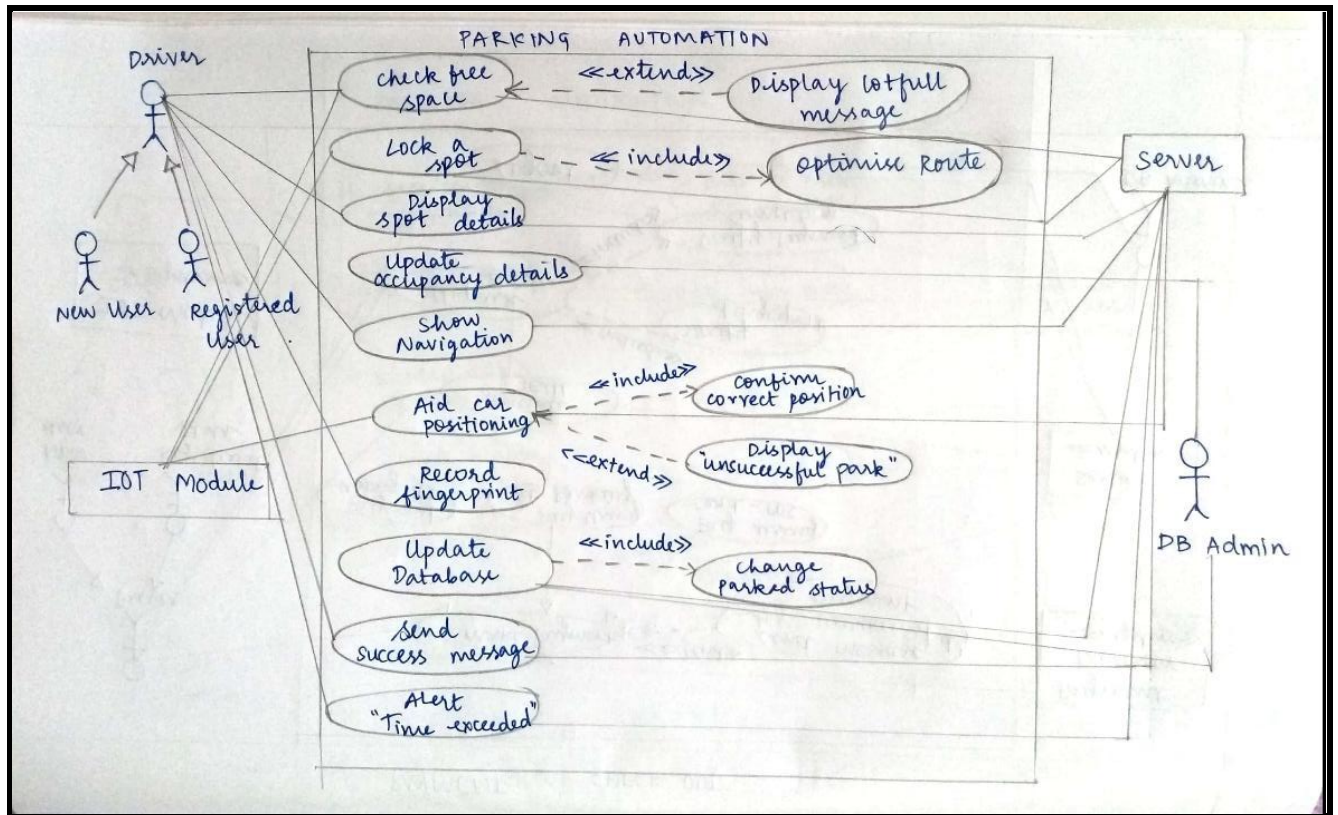
The first revision (1.0) of the design project is thus documented keeping in mind the specified stakeholders and their requirements.

## Use Case Diagrams

### Check - in

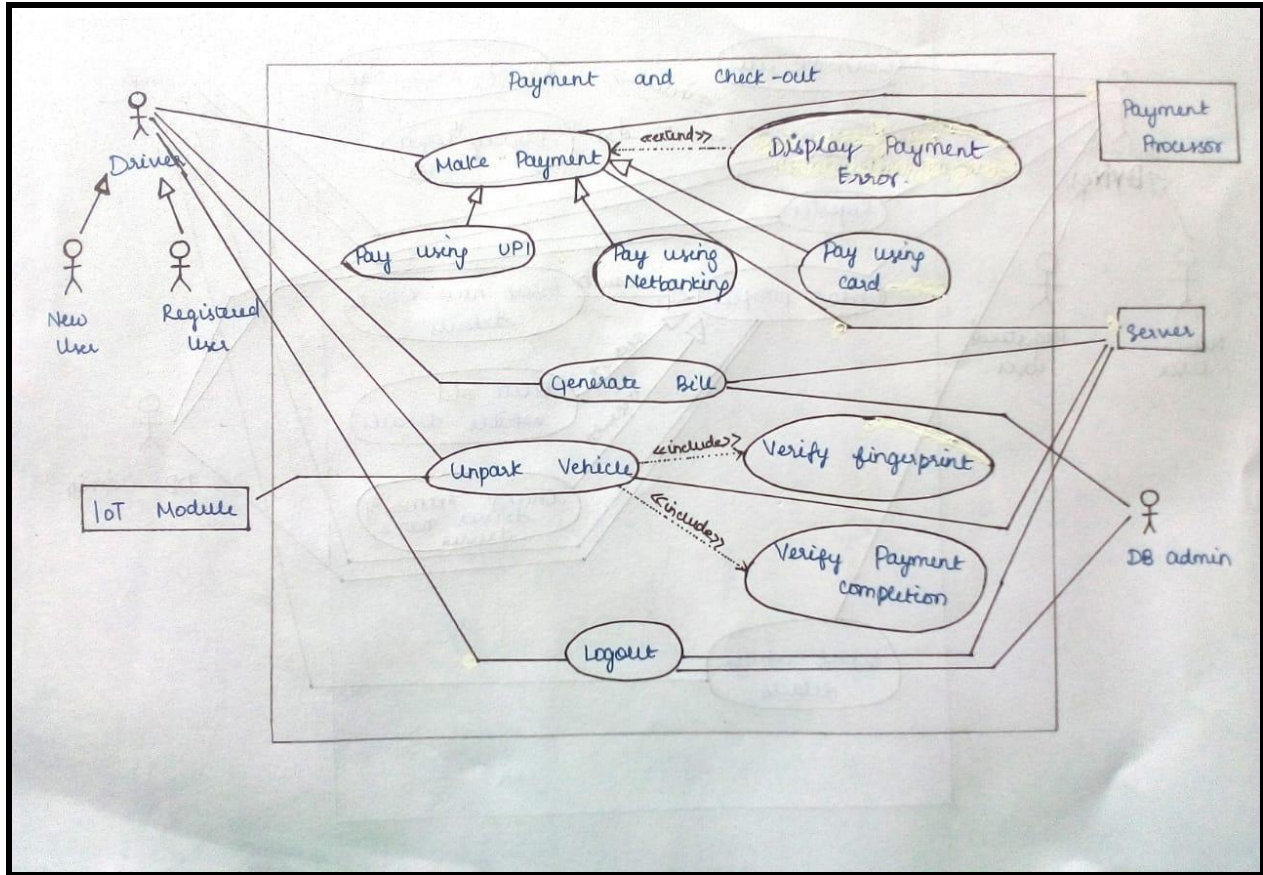


### Parking Automation



Payment and Check - out





## Two main use cases :

### 1. Check for free space for the vehicle

Scope : System under consideration

Level : User goal

Primary Actor : Driver, IoT Module, Server

Stakeholders and Interests : Driver: wishes to park his vehicle at the parking slot

Precondition : User should select a vehicle from his previous visits/ Inserts new vehicle details

Post Condition : The system optimises the route for a parking slot from the driver's point of entry and locks that particular spot

## 2. Show navigation to the slot

Scope : System under consideration

Level : User goal

Primary Actor : Driver, Server

Stakeholders and Interests : Driver: wishes to navigate through the way from his current locations to the locked slot

Precondition : The database should be updated of the occupancy details of the locked spot with the details of the parking vehicle in the database

Post Condition : After reaching the spot, the system helps in car positioning at the spot with the help of IoT module