Software Requirements Specification

(SRS)

For

Book My Space

GROUP NO: G7

MEMBERS

ARIB ASHHAR SHAMOON

19COB028

GJ3809

VAIBHAV

19COB025

GL3109

SUPERVISOR: Prof. SYED USMAN AHMED

Department of Computer Engineering
Aligarh Muslim University
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1.   INTRODUCTION

1.1 Scope

- **PROBLEM STATEMENT**

        As customers, the major problem we face today while looking for a parking slot wherever we go either a mall, theatre, sports event, hospital or any public place is availability of parking spots. Even if we get an available parking spot in the parking lot we plan to go to, there is always lack of proper management. Most common scenario in today's parking Lot is when we walkin asks the security person if there is any spot available then he checks his register. If there's no spot then we have just wasted our 20 - 30 minutes driving there. In case there is a spot available the security person cuts a ticket give it to us and tells us the floor number(in case of big structured parking lots) or points us randomly to free area(in case of small parking lots) from there on it's our problem to look for the space, park our vehicle and get to our work.

Let's imagine a scenario where we have a medical emergency. We went to JNMC straight to the emergency block, dropped our patient, now next thing instead of being with our victim and doctors first we have to deal with parking slot availability, parking ticket and all that mess.

Let's say we are going to the theatre, railway station or any such public place where there is always rush and humongous traffic and we are really late, again first we have to deal with the same mess.

Lastly, let's imagine we are going to the famous Aligarh numaish now we all have dealt with the vehicle parking crisis where we don't have any idea whether we are going to find any available spot or not or we have to risk the security and park our vehicle randomly on roadside and eslate the already traffic crisis.

        As the parking lot manager/owner the major problem they face is the proper management of parking booking. Of Course they could install something like a smart parking booking system but neither many of them can afford the expenditure nor do they have the infrastructure (Even when they do install such systems the hardwares have a life span, and in India it's most common when we install something even as small as a CCTV camera once they get out of service mostly they don't get replaced so sooner or later these technologies are merely a showpiece). And another major issue the parking lot owner faces is the credibility of security person appointed at parking lots, it's not like the owner comes in every day to check the register for total income of the day, and the security person may as well be deceiving and not entering all the records to save some money off the book.

- **PROPOSED SOLUTION**

        Earlier when had to book a train ticket or a bus/flight ticket first we had to go to the railway station / bus stand / airport inquire about the trains available, seats available and then we were able to book tickets and we should not forget the long lines / hours we had to wait to get the our answer and ticket. But then with changing times came the online

reservation and now we can book tickets / look for available seats from the comfort of our home and also we don't need to hear the constant nagging "Are jaldi karo bhaiya". Similarly came the online ticket booking for theatres, public rides, amusement parks and what not.

So if there was any trustworthy platform to book parking slots online whenever and wherever we want, wouldn't that be nice. With a platform like this we can deal with the most common problem of finding available parking slots. And we can just search for the place/address where we want a parking lot and it can show the results of all parking lots within a radius. And then we can just look for an available slot for the duration, date, time we want and book it. It can reduce that hassle and mess of finding a parking spot. We won't need to deal with the security person. All we need to do is show him the booking details and move our vehicle to our spot directly since we already have the details about the spot (like floor number, spot number). It will be just like a train ticket, we have already booked the ticket and show it to the TTE on our mobile phone. And for those parking lots that have better infrastructure we can just scan QR generated at the time of booking like we do in smart toll service and even make the customer experience faster and effortless.

Now lets again imagine the first scenario now on our way to JNMC we can just look if there is a spot available in JNMC or any other parking lot nearby we book it(within 2-3 minutes) while we are still on our way and just park the vehicle on arriving and be with our patient, no mess of looking, purchasing tickets finding spot.

Now the second scenario we are really late to catch the train but this time we can book our spot while on our way and not just reduce the mess of finding spot we can even find and book the closest spot to the railway station entrance and hopefully we will be able to catch the train which we most likely would have missed if we had to deal with the mess.

For the last scenario mentioned above, we don't need to wait for the suspense of whether we will get a spot or not or we have to park on the roadside if we don't. Let's say we planned to go to numaish tomorrow evening, then we will book the spot today itself or the earliest and enjoy our evening tension-free.

As per the parking lot manager/owner they can either spend the money and install a smart parking booking system (if they can afford it) or they can just register their business on a free web platform and fill in all the details (such as number of parking slots, parking charges, time and duration..etc). Now whether it be a parking lot for numaish, hospital, university, theatre, railway station, bus stop, airport or public place they can all register and have managed their bookings in a more automated and optimised way with maximum profit. The owner no longer needs to check the register, they can just login anytime they want and see all the bookings done till date and price received and they can deal with security personnel in case of any discrepancies. If they have the infrastructure and they can afford it they can just install a QR scanner and a payment receiving machine (for those who don't make payment online) at the entrance and fully automate the whole parking lot (like smart toll services). Parking lot managers can still have both options for their customer either they can book online or they can walk in and book like they used to do earlier with a ticket and all the mess. But here we will need them to update the data regularly.

Example: Let's say I have a parking Lot with a capacity of 400 slots with both booking options, up until 11:26 a.m 126 bookings has been done online and 45 have done walkin bookings so the security person or who is managing the parking they will have to login(from manager account) and enter the data that these 45 spots have been booked offline and we will automate the rest 126 bookings so when someone look for a spot at 11:26 a.m he sees there are 229 spots available. This way the user gets the live and correct details about the availability.

This is a drawback or we can say an extra work needed to be done from the user side. But there are also extra side gains like the cost of ticket production, material wastage of the register can be minimized, the booking data will never get lost, with online exposure they parking lots will have more customer retention and income from more booking than they used to get earlier.

- **PROJECT DESCRIPTION**

   Book My Space is a web application for online vehicle parking slot booking and its management. It is a web based platform where people can just search for the area, address they are going and want a parking spot to park their vehicle and get results of all parking lots within a radius and they can book a spot in any one of them based on their availability and users choice for distance, price, duration, time, date.

Any parking lot manager/owner will be able to register their parking lot and automate the current manual effort of booking, payments, and management of parking spots.

- **TYPES OF USERS**

1. Customer: one who is looking to book a slot.
2. Parking Lot Manager: one who owns/manages the parking lot.

1.2   Technologies to be used

- FRONTEND: HTML, CSS, JavaScript (we can also use reactJS if there's a need)
- BACKEND: python, MySQL, django(framework)
- API: Google Maps Geocoding API, JavaScript API
- Chart.js

2. GENERAL REQUIREMENTS

2.1 *Functionalities*

2.1.1 USER REGISTRATION
User(Customer) have to **register/sign-up** himself/herself on the platform by providing some basic details like name , address and log in credentials. This step is necessary for storing the user data in the database.

2.1.2 PARKING LOT SEARCH
Users (Customers) can search for nearby parking lots using the address or name of place they are/will be going or they can use their device's location feature to enter the location using map and they can filter the search result based on price, availability, timing, duration, distance, rating etc.

2.1.3 BOOKING PARKING SPOT
After customer have made their choice they can book the spot for desired date and time and also make payment online(optional) and after the booking is successful the parking spot booking details (such as spot number, floor number, time, date, charges to pay/paid) with be available to the customer and a QR will be generated for faster customer experience. And the same details regarding the booking will be sent to the parking lot manager with automated data entry in their database. Users can also remove or add a parking slot at any time.

2.1.4 REGISTER PARKING LOT
Parking lot owner/manager will be able to sign-up and register their parking lot with all the details (such as number of slots, operation timing, parkings, charges, security details, address...etc) .

2.1.5 MANAGE PARKING LOT
Parking lot owner and manager will be able to see all the details such as number of bookings done today/ this week/ this month, total earning...etc. They will be able to manage and update their data if bookings are also done offline, new spots constructed, parking charges changed, security personnel changed etc .
But, their will be a need of manual work from the Parking Lot Manager side for regularly updating the number of slots available on the website.

2.1.6 PAYMENT GATEWAY

the customers will be able make online payment beforehand for faster parking, the parking manager will be able to add their payment modes available like Credit Card, Debit Card, UPI , Net Banking or any such ways.
They will also be able to make payment offline.

2.1.7 FEEDBACK AND RATING MECHANISM

Customers have an option to give feedback after service in the form of review and rating with which can optimise search results using algorithms like ELO rating algorithm or something similar.
It will help in making the platform more reliable and reasonable.

However, it will not mandatory to give rating and reviews or feedback it will only depend on the user's choice as to whether he/she wants to give feedback or not.

2.2   Use Case Model Diagrams
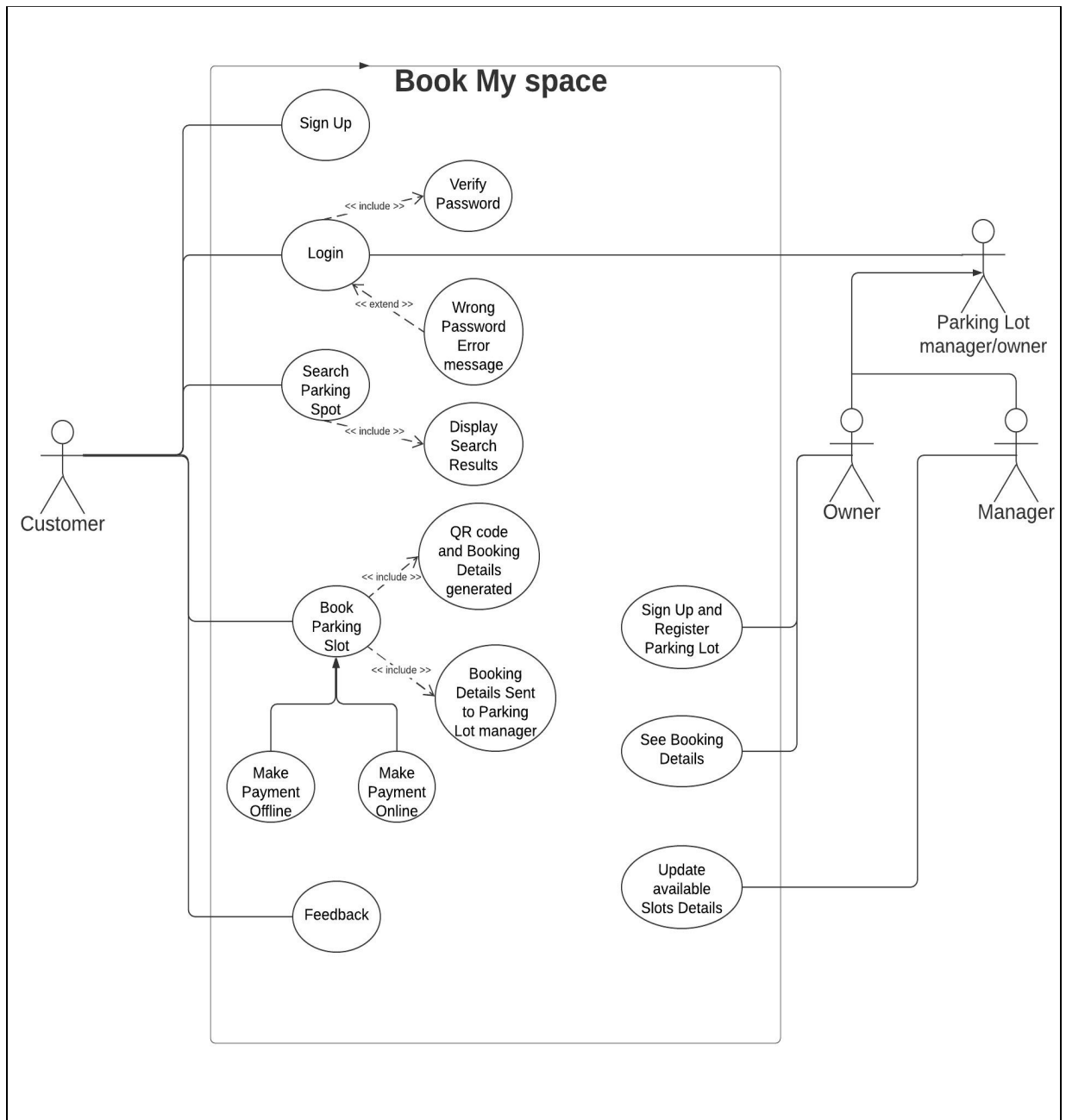
2.3   Interfaces

2.3.1 USER INTERFACE

The UI of our platform/website will be easy to use and understandable. Firstly, We will use the English language .
If the user knows how to use an Android mobile phone or Internet and be able to write and read simple words and use buttons , then he/she can easily use our platform.

2.3.1.1   Interface for Customer
On the HomePage,there are two buttons one is for customer (who is looking for a parking slot) and the second button is for ParkingLot Manager (one who owns/manages the parking lot).If you are a person who is looking for a parking slot just click on the first button.

2.3.1.1.1   Login Interface
In this interface, there will be a login button . If user have not already registered to the platform/website , he/she will use register button and register for it.

2.3.1.1.2   SignUp Interface
In this interface the user register to the system by giving details in a provided text field.There will be a register button. After user filled the required fields with his/her information (username , password,address etc.). Click to register button and be able to login to the platform.

2.3.1.2 Interface for Parking Lot Manager

On the HomePage , Click on the Parking Lot Manager Button.

2.3.1.2.1   Login Interface
In this interface, there will be a login button . If parking lot manager have not already registered to the platform, he/she will use the register button and register for it.

2.3.1.2.2   Register Interface

In this interface the parking lot manager register to the system by giving details in a provided text field.There will be a register button. After owner/manager filled the required fields with his/her parking lot information(parking lot address , number of total slots , parking lot name and more). Click to register button and be able to login to the platform.

2.3.2   HARDWARE INTERFACE

This website works on Android, IOS mobile devices, tablets and Laptops. No other hardware is required.

2.3.3   SOFTWARE INTERFACE

Since our platform is available in website form and hence, can easily runs on a standard version of a Web Browser.

2.3.4   COMMUNICATIONS INTERFACE

Our platform works on Internet provided by any Internet Service Provider and it can also work on Wi-Fi network.

2.4   General Constraints

- Despite being an online platform, the platform requires some manual work from the Parking Lot Manager side. If any other booking for the slots are done offline and not from our platform then the manager will have to update the data for available slots by logging in to the website. So that customer can get live and accurate data for available slots.
- If the User don't have a smartphone , tablet or laptop , then he/she will not be able to use our platform.Although he/she can take help from someone.
- If the User don't have an active internet connection , then he/she will not be able to use our platform.

2.5 Supplementary Requirements

- Google Maps API: Our project requires google maps API for geocoding and Javascript rendering. Geocoding helps in converting a raw string of any address and give and an JSON Object which consist of all the details regarding that address including latitudes and longitudes. We specifically need Latitudes and Longitudes to mark the address on google maps and embed it in the parking Lot details page. Reverse geocoding does the opposite of that: it converts latitudes and longitudes and gives the address which will help in Detecting my location feature.
- Chart.js: We need this open Source library to convert raw stats into graphs, pie charts.
- Other Third Party Services: Such as twilio for text message services, email services. But Since it is not free, we cannot implement text message & email notification features for all mobile numbers (just for one mobile number is possible).

3. DEFINITIONS, ACRONYMS AND ABBREVIATIONS

- BMS - **Book My Space**, is the title name of this project.

- JNMC - **Jawaharlal Nehru Medical College** is the constituent medical college of Aligarh Muslim University, located in Aligarh, in the Indian state of Uttar Pradesh.

- CCTV - **Closed-circuit television (CCTV)**, also known as video surveillance, is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors.

- TTE - **Train Ticket Examiner**, checks and ensures that the seat has been rightly allotted to the passengers in the train.

- QR - A **QR Code** (abbreviated from **Quick Response code**) is a type of matrix barcode (or two-dimensional barcode). A barcode is a machine-readable optical label that contains information about the item to which it is attached.

- HTML - The **HyperText Markup Language** is the standard markup language for documents designed to be displayed in a web browser.

- CSS - **Cascading Style Sheets** (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML.CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts.

- JS - **JavaScript,** is a scripting and programming language. It is one of the core technologies of web development and can be used on both the front-end and the back-end.

- MySQL - "SQL", the abbreviation for **Structured Query Language**. A relational database organizes data into one or more data tables in which data types may be related to each other; these relations help structure the data. SQL is a language programmers use to create, modify and extract data from the relational database, as well as control user access to the database.

- ELO rating algorithm - The **Elo rating system** is a method for calculating the relative skill levels of players in zero-sum games such as chess.

- UI - UI stands for **User Interface** , refers to the elements by which people interact with a product, such as buttons, icons, menu bars , colors and more.

- Wi-Fi - stands for **wireless fidelity**, It is a wireless technology used to connect computers, tablets, smartphones and other devices to the internet.
- API - An application programming interface is a connection between computers or between computer programs. It is a type of software interface, offering a service to other pieces of software.

4.   REFERENCES

- https://www.planyo.com/car-parking-booking-system.php

- http://synopsis.nevemtech.com/index.aspx?Id=S270

- This is not exactly similar to our project, it is actually a smart parking booking system that needed to be installed individually for the parking lot (Link)
- https://docs.djangoproject.com/en/3.2/topics/db/queries/
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