Software Requirements Specification

for

Online Smart Parking system (website)

Version 1.0 approved

Table of Contents

Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The purpose of this document is to build an online smart parking system which is

- able to allow end users reserve parking spots online
- Kept updated with real-time information to ensure no spot is double booked.
- Allow end users must be able to find parking spots in various places.
- Accept various payment options.
- Print parking receipt and voucher.
- Be integrated and be user friendly and easy to navigate to enable those with little technological knowledge to use the system.

Hence this overcomes the problem of inappropriate parking and waiting time.

1.2 Document Conventions

- In general this document follows the IEEE formatting requirements.
- Times New roman font size 18,14 or 12 has been used throughout the document for text.
- Italics has been used for comments.
- Document text is single spaced and the 1" margins are maintained.

1.3 Intended Audience and Reading Suggestions

- This project is a prototype for the SPS and it is particularly designed for big metro cities comprising of surplus automobiles
- This has been implemented under the guidance of college professors. This project is useful for all automobile owners who find it difficult to park in big metro cities and also for the parking spaces that would ultimately get the benefit from people parking there.
- implemented at shopping malls of big metropolitan cities.

1.4 Product Scope

Our proposed project is an online parking booking system which provides customers a way of reserving a parking space online. It helps to overcome the problem of finding a place for parking in commercial areas that unnecessarily consumes time. Hence the project will be a web-based reservation system where users can view various parking areas and select the space to view whether space is available or not. If the booking space is available then he/she can book it for a specific time slot. Users can also make online payment for booking. After making the payment users are notified about the booking with a unique parking number.

The project aims to avoid the rush in parking slots for choosing an empty space and reduce the number of cars waiting or searching for parking venues . The application shall run on different platforms. The application forms an individual parking space for each vehicle prior to their entry in that area/zone. The application asks the user to choose their desired space for parking. The

application mainly checks this capability.The project is first developed on a Web-based application like a website, but later it can be developed on Android/IOS applications if the customers want

1.5 References

★ IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications
★ IEEE Computer Society, 1998
★ https://www.researchgate.net/publication/224219865_Smart_parking_reservation_system_using_short_message_services_SMS
★ https://www.researchgate.net/publication/298011877_Zigbee_and_gsm_based_secure_vehicle_parking_management_and_reservation_system
★ https://www.researchgate.net/publication/261304502_Smart_parking_service_based_on_Wireless_Sensor_Networks
★ https://www.ijarcce.com/upload/2013/october/59-O-dharmareddy_-AN_INTELLIGENT.pdf

2. Overall Description

2.1 Product Perspective

This website is the final product and this should be able to provide an easy and efficient way to solve the parking problems in shopping malls. This should also be able to provide a basic and easy interchange of information of the customers and the mall authorities for security purposes of the mall if necessary. This should also be able to fill the gap between admin(authorities) and customers(users) by attending to their queries. This product should be finally compatible with all operating systems for the flexible and easy usage of the customers.

2.2 Product Functions

1)Login function for the customers to easily login and verify their credibility so that they can proceed to the booking page.

2)Login function for the admins to avoid the misuse of their functionalities and to preserve the privacy of the customers.

3)View parking function is used to give the customers comfortable and easy visualization ,to book their parking slot accordingly by considering the filled slots.

4)Book parking function is created to ease the bookings and successful payments. Customers are provided different modes of payment.

5)Confirmation function is created to confirm the customer’s bookings by sending an email to them and a thank you message.

6)Cancellation function is also created to consider the problems of the customers and also to fill that parking slot so that that slot would not be left unused.

7)Feedback function is also equally important to consider the problems of the customers and to improve the website functionalities according to the customer’s satisfaction.

2.3 User Classes and Characteristics

1)A user can only have one account with a combination of the same email and phone number at the time of account creation. This avoids misuse, unauthorized access and hacking of the product.

2)Users are allowed to use all the user functionalities mentioned below.

USER FUNCTIONS:

Login to account

View availability

Booking function

Cancellation

Feedback

3)Users are all considered equally and have the same functionalities regardless of their purpose of their visit to the mall.VIP customers just have different parking slots to be booked but all the functionalities remain the same.

2.4 Operating Environment

Operating environment for the online smart parking system is as listed below.

1)distributed database

2)client/server system

3)Operating system: Windows.

4)database: sql + database

5)platform:Java/PHP

6)Processor (At least Pentium 4)

7) Sufficient RAM

8) HARD Disk

9) Other normal computer hardware parts

2.5 Design and Implementation Constraints

1)Entity relationship diagram is designed according to fulfill all the requirements and functionalities.
2)The global schema, fragmentation schema, and allocation schema.
3)SQL commands for the implementation of the designed entity-relationship diagram are written in the form of queries.
4)Implement the database at least using a centralized database management system.
5)Server capacity is also a constraint taken into consideration in order to avoid network traffic and server down.

2.6 User Documentation

1)The customers are provided an user manual in the login page of this website that has all the functionalities and their detailed explanation of their usage. By referring to these materials,users can easily know the steps and can easily follow them to prevent any errors during bookings and also payments.

2)If the users are yet unclear about the usage phone number or email id will be provided in the login page to provide maximum help from the admin and the authorities side.

2.7 Assumptions and Dependencies

1)This website should be compatible with most of the operating systems (i.e previous and most latest ones)

2)We assume that all the customers are online users and have to beforehand book the parking slots using this website. No offline booking is considered during this project.

3)Users are not allowed to change the password that is recorded during the creation of their respective accounts.

4)It is assumed that this website works even when the network traffic is high.

5)Server should have a power backup and also database backup is assumed for smooth completion of the project.

6)Assuming all the transactions are single transactions in the payment portal.

3. External Interface Requirements

3.1 User Interfaces

The project will be deployed over the web. Hence the user is required to have an electronic device (such as a laptop or mobile) to view the website. The home screen offers a menu with a list of functions that the device performs. The user can select one of the options on the menu and is taken to the respective screen. Every screen displays the menu on the bottom. The user can click on any of the options and is taken to the screen of their choice. The end users are the customers of the parking place. The end users can have access to book, view, pay for their slots. The landing page will consist of logging in of admin and customer (existing account and new user), This user interface prompts the user to authenticate his/her credentials by asking for username and password so that only authorized users can log in to the system. Also, it displays an error message and exits if the given credentials are wrong. The logged in customer will be directed to a page where he/she can book a slot at the required location and also finish the payment, view previous bookings etc. The administrators also have a different interface to generate reports and manage payments of users.

- Front-end software: HTML Jscript Bootstrap PHP
- web server: XAMPP
- Back-end software: MySQL

3.2 Hardware Interfaces

The external hardware interface used for accessing the Parking System is the personal computers, mobiles or any other electronic devices with internet access of the end-users containing a browser that supports CGI, HTML & Javascript.

Processor: Dual Core

RAM: Minimum of 2 GB

The two parties should be connected by LAN or WAN for the communication purpose.

3.3 Software Interfaces

PHP is a popular general-purpose scripting language that is especially Fast, flexible and pragmatic which connects the frontend code to the SQL database. That is compatible with Windows, Linux & Mac operating systems Software is web-based so software needs a web browser and internet connection. All these make the project work on any of the Operating Systems of any version of Windows, Linux, UNIX or Mac which supports TCP/IP protocols.

3.4 Communications Interfaces

The communication interface is a local area network through Ethernet or can be of any broadband connection or any Internet service provider. This project supports all types of web browsers. It follows the client-server model. The users can communicate with the system using browser and internet once user logins can easily book a parking slot.

4. System Features

4.1 Login to account

4.1.1 Description and Priority :

Admin login : The system is under the supervision of the admin who manages the bookings made

User login/registration : Users have to first register themselves to login into the system

4.1.2 Stimulus/response sequences:

1) The user/admin enters the required credentials
2) The system responds by logging into the home page for users Administration page for admin

4.1.3 Functional requirements :

REQ1: For admin login there must be a username and password field and Login button

REQ2: For user registration there must be a registration form which Contains fields like name , phone number , email and password.

REQ3: For user login requirements are similar to REQ1

4.2 View Parking

4.2.1 Description and Priority :

The system will provide users with parking areas of three floors. The User can click on spaces to view the availability. If space is already booked it'll be marked yellow and therefore the available ones are going to be seen in normal colour.

4.2.2 Stimulus/response sequences :

1) The user has an option to select one of three floors in which they can park
2) The system displays the parking area to the user from which he can Select a vacant space to park

4.2.3 Functional requirements :

REQ 1: There must be an option for the user to select between the three Floors

REQ2 : The parking spaces should be yellow in colour if they have already already been booked and should displayed in white otherwise

4.3 Book Parking

4.3.1 Description and Priority :

The Users can book parking space for their required date and time. The system calculates the total cost incurred for parking based on the time that the user has asked for booking. When the user is successful in parking the space, the system sends a confirmation and 'thank you' email regarding the space booked

4.3.2 Stimulus/response sequences :

1) If the user a books a parking space by entering the date and time for the Preferred parking space the payment options are displayed
2) The user selects the payment method and completes the payment
3) Once the payment is completed a SMS or an email is sent to the user

4.3.3 Functional requirements :

REQ 1: There must be an option for the user to select between the three Floors

REQ 2: After the user selects the parking slot and the timing the cost must be calculated and displayed and they must be provided with payment options

REQ3: the user must receive a SMS or email after successful payment

4.4 Cancel Booking

4.4.1 Description and Priority:

The users can cancel their bookings by logging into the system

4.4.2 Stimulus/response sequences :

1) If the user clicks on cancel booking the amount is refunded depending On how late the user has cancelled the booking and a email or SMS is sent
2) After the cancellation is done the parking spot booked turns back to vacant

4.4.3 Functional requirements:

REQ1 : when the user cancels a booking the parking slot must turn back to White and depending on how late the user has applied for cancelling the amount must be deducted and returned

REQ2 : after cancelling the user must receive a mail or SMS about the same.

4.5 Feedback

4.5.1 Description and Priority:

The system has a feedback form, where the user can provide feedback into the system

4.5.2 Stimulus/response sequences :

when the user fills the feedback form and sends it a 'feedback received' Pop up appears.

4.5.3 Functional requirements:

REQ1 : A feedback form must be displayed asking the users to enter their Feedback

4.6 Logout

4.6.1 Description and Priority:

Used to logout of the system

4.6.2 Stimulus/response sequences :

1)If the user clicks on the Logout button then he/she exits the website.

4.6.3 Functional requirements:

REQ1 : if the user clicks the logout button he/she should exit the website

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- The system shall be available 24/7
- When data / information is requested it shall be presented on screen within 2- 3seconds
- System shall be able to accommodate multiple users simultaneous at a time

5.2 Safety Requirements

- No data loss as backup should be taken
- No misuse of user credentials
- Malpractice regarding user's banking details or personal details should not be entertained

5.3 Security Requirements

➢ Authentication
- System users can register using a username/password combination. These users rely on a server certificate issued by a trusted certificate authority, to authenticate the selling system over a secure transport.

➢ Authorization
- Authenticated system users to a deployment can have access to multiple services without having to sign on more than once.

➢ Identity Management
- System must have a way to odd, modify, or delete users who will be accessing system services.

➢ data management
- security systems need database storage just like many other applications. However, the special requirements of the security market mean that vendors must choose their database partner carefully.

5.4 Software Quality Attributes

- Agreement of program code with specification.
- Independence of the actual application of the software system
- Availability of application within the workspace
- maintaining the correct scheduling and reservations of slot
- usability product should satisfy all the requirements of customers

5.5 Business Rules:

- every user must register themselves using user id and password to use the product
- users should give feedback and rating
- users must be able book or cancel the transaction before restricted time
- In case of any errors, revert any changes made to the system and reverse transactions if possible

Appendix A: Glossary

S.no	Abbreviation	Meaning:
01	ER	Entity Relationship
02	OSPS	Online Smart Parking System

Use cases

1. casual description of use cases

use case uc-1 register:

This use case allows a user to register for the new users. The user can also modify or delete accounts if any changes are needed.It is mainly used for the creation of an account to the new users. So the main actors of this use case are the new users.

use case uc-2 login:

This use case describes how a user logs into the Online smart parking system
the main actors of this use case is registered users

use case uc-3 view parking:

This use case allows a user to view the available parking spaces for booking them
the main actors for these uses case is users , also management system

use case uc-4 book parking :

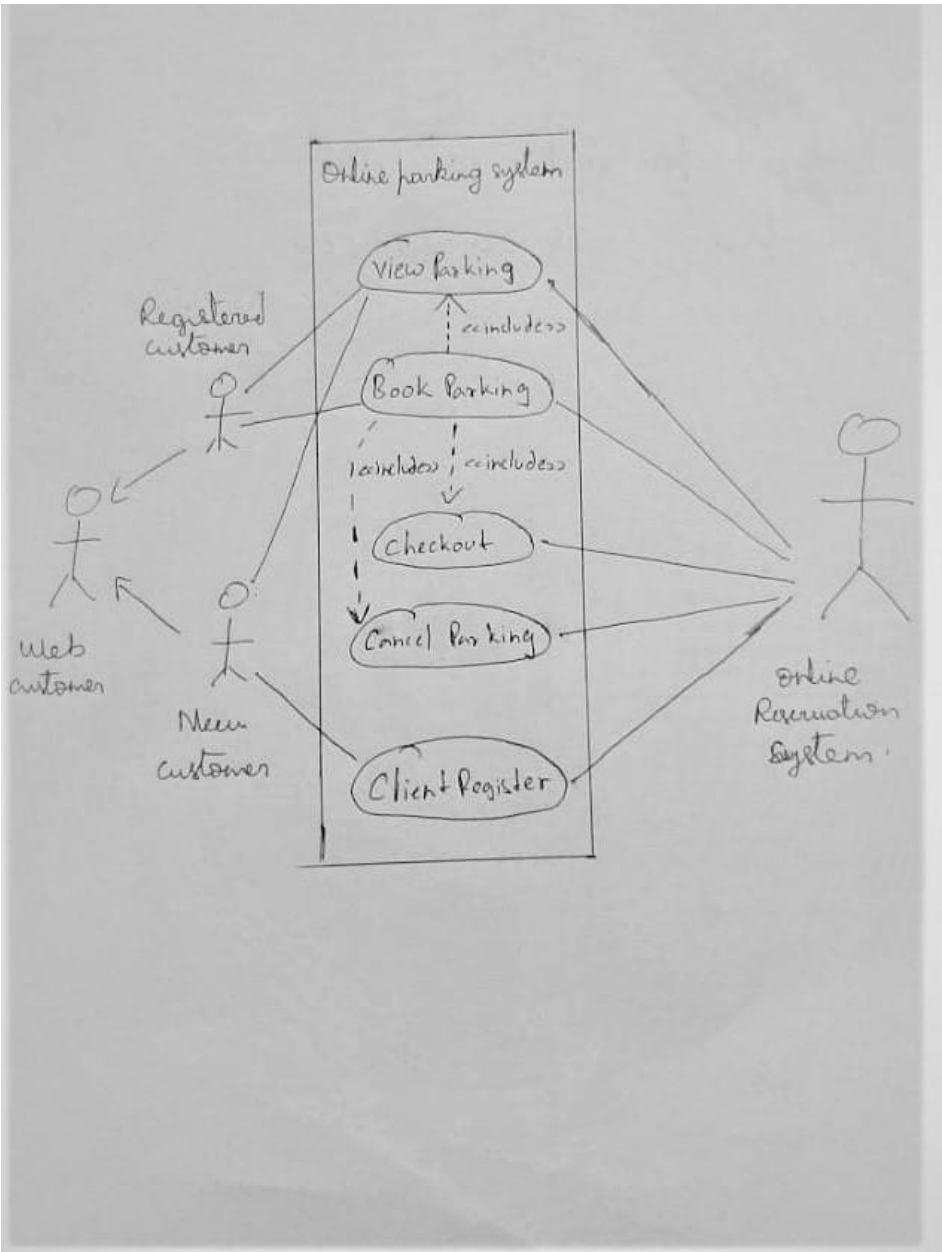
This use cases allows the users to make bookings for the parking slots and secure transitions of payments etc..,
The main actors of this use case is users and reservation management system and also include actors for payment gateway like paypal etc..,

use case uc-5 check out:
This use case is required for the user to make payment after booking a parking spot.
The actors in this use case are the users who have booked a parking spot and the reservation system.

use case uc-6 cancel booking :

This use case allows the user to make any cancellations , this process the system must go through to cancel reservations. This would occur if the customer failed to cancel their reservation prior to the check-in deadline described by the reservation management system
The main actors of this use case are users and we can include management systems also .

2. use case diagram:


Online parking system
View Parking
<<include>>
Book Parking
<<include>>
<<include>>
Checkout
Cancel Parking
Client Register
Registered customer
Web customer
Mean customer
Online Reservation System