“ParkSMART”– The car park manager

System Requirements Specification (SRS)

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1.0 INTRODUCTION

1.1 Identification

This System Requirements Specification (SRS) describes the requirements for the ParkSMART System. This document will be reviewed and approved and will then serve as the complete set of requirements necessary for the system to continue into future stages of development. After approval of this SRS, future changes to requirements will be made by submitting Requirements Change Requests.

1.2 System Overview

This section provides a brief overview of the necessity for the ParkSMART system. This also briefly examines the ParkSMART structure and its interaction with the environment through a context diagram.

1.2.1 The need of ParkSMART

Problem Statement:

Finding a parking space at the car park of GT Nexus premises is a common frustration within the staff members. This has become very time consuming and finding an empty slot has now become a guessing game and a matter of luck.

The position of the main car park on the land side of Galle Road has made it even hard for the staff members due to the prevailing traffic conditions. Most of the times they end up having to utilize the secondary car park situated in front Crescat Boulevard .

Bringing an effective solution to this issue , The ParkSMART system will provide a method for the staff to search the real-time availability of free spaces in the two car parks.

1.2.2 ParkSMART System Context

The ParkSMART system functionality is organized into two major subsystems. Each of these subsystems is described in detail in section 1.5 along with a further breakdown of each subsystem. The two top-level subsystems are as follows:

- A cross platform mobile application
- A web system

Figure 1.2-1 shown below, visualizes the subsystems under the ParkSMART system.

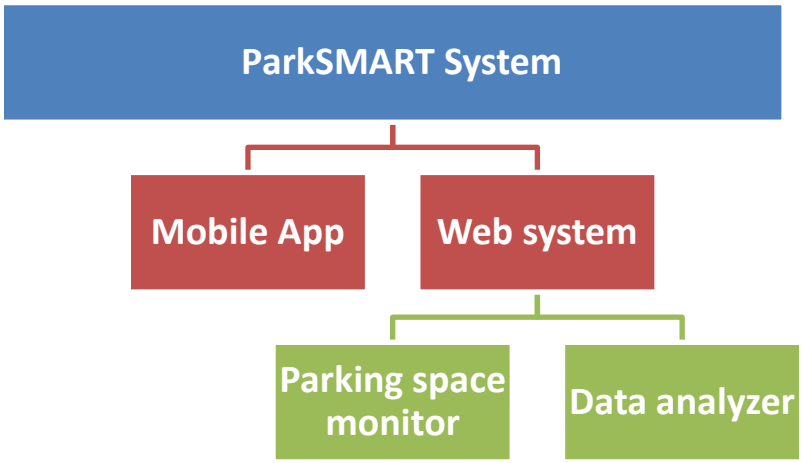

Figure 1.2-1 - Subsystem Diagram

1.3 User Definition

1.3.1 Customer

The Customer is defined as the user who is accessing the system to view the current state of the parking situation in the GT Nexus premises. The Customers include staff members and as well as visitors looking for parking spaces.

1.3.2 Operator

The Operator is defined as the user who is accessing the system in order to provide maintenance/administrator functions, initialize and setup the system, monitor the system, run queries on data for analysis and finally update the ParkSMART system with regards to the available no. of slots.

1.4 Document Overview

This SRS contains the requirements necessary to perform analysis of alternatives and design the ParkSMART system in full compliance with the requirements and expectations of the staff of GT Nexus.

1.5 Concept of Operations

The ParkSMART system is a system that combines both hardware and software to provide users with situational awareness of the parking infrastructure. This user interaction would allow the user to look up what spaces are available at any of the parking lots in the two car parking areas.

1.6 Overview of Functionality

This section provides a brief explanation of the functional components of the ParkSMART system.

1.6.1 Primary Subsystems

In this section, descriptions of the primary subsystems are provided to gain a better understanding of how each of the subsystems contributes to the overall functionality of the system.

1.6.1.1 Mobile App

The Mobile App subsystem is the portion of the system where users interact with the ParkSMART system in order to view data contained by the system.

1.6.1.2 Web system

The Web subsystem is divided into two separate secondary subsystems, Parking space monitor and Data Analyzer .

1.6.1.2.1 Parking space monitor

The Parking Space Monitoring subsystem is responsible for the detection of all parking spaces at the car two car parks and determining if they are occupied or empty. Then it updates the database real time when a vehicle enters or leaves the car park.

1.6.1.2.2 Data Analyzer

This is responsible for storing the necessary data associated with the parking spaces as well as the database for collecting parking data for further parking research and optimization. Then it has to analyze the available no.of slots with the total capacity and send an update to the subscribed users via the mobile app.

2.0 APPLICABLE DOCUMENTS

GT Nexus Car Park Maps

3.0 REQUIREMENTS

This section describes the requirements that must be met for the ParkSMART system design. Requirement types subdivide the section: Functional and Non-Functional.

3.1 Functional Requirements

This section contains the functional requirements required of the ParkSMART system arranged by subsystem. The requirements in this section specify the functions that each subsystem can perform.

3.1.1 Web System

This section specifies the requirements that must be performed by the Web subsystem.

3.1.1.1 - The ParkSMART system shall be capable of transmitting data to the user-interface at an update rate of once every 30 seconds.

3.1.1.2 - The ParkSMART system shall be capable of receiving data from the parking space monitoring subsystem at a constant rate.

3.1.1.6 - The ParkSMART system shall be able to allow the customer to reserve a vacant slot, provided that the customer is within 500m away from the car park.

3.1.1.8 - The ParkSMART system shall be able to display and print reports of the data stored on the network based on user specified criteria.

3.1.1.9 - The ParkSMART system shall provide security to protect the integrity of the data and the information that it contains.

3.1.1.11 - The ParkSMART system shall be able to transmit a broadcast signal containing the current parking space availability to all receiving devices upon the request of the users and push a notification if the car parks are full.

3.1.3.10 - The ParkSMART system shall provide the operator with the ability to print daily, weekly, monthly, and annual reports of the parking spaces usage, and allow the operator to customize the type of output that is desired. This output would include certain lot usage, usage between certain times of the day, number of visitors requesting information from the system.

3.1.1.1 Parking Space Monitoring

This section specifies the requirements that must be met by the Parking Space Monitoring subsystem.

3.1.2.1 - The ParkSMART system shall be able to update the database upon the arrival or exit of a vehicle.

3.1.2.2 - The ParkSMART system shall be able to detect when and if each individual parking space is unoccupied (in 30 second increments) and be able to report this information to the data analyzer.

3.1.2 Mobile App

This section specifies the requirements that must be seen by the Mobile App subsystem of ParkSMART.

3.1.3.1 - The ParkSMART system shall provide the customer with choices as to what criteria are to be used to determine the best available space for them. These criteria shall include (but not limited to) type of vehicle and the preffered car park i.e. main car park or the supplementary car park.

3.1.3.3 - The ParkSMART system shall be able to allow the user to reserve a slot once they are within the radius if 500m from the car park.

3.1.3.5 - The ParkSMART system shall provide the customer to receive an update about the available no. of slots at the time of the request.

3.1.3.11 - The ParkSMART system shall provide users with 24/7 availability with the exception being during scheduled maintenance periods.

3.1.3.12 - The ParkSMART system shall be accessible via the Internet.

3.2 Non-Functional Requirements

This section specifies the non-functional requirements required of the ParkSMART system. This section is organized by category of requirement.

3.2.1 Performance

This section specifies the performance requirements that the ParkSMART system must adhere to.

3.2.1.1 - The ParkSMART system shall be able to provide continuous updating of every parking space monitored on a 30 second cycle. This involves designing an optimized scheduling algorithm.

3.2.1.2 - The ParkSMART system shall be able to provide the user with the information that contains the most recent updates of the parking spaces.

3.2.1.3 - The ParkSMART system shall be able to push a notification on the customer's mobile phone if the car parks are full.

(Phone and Internet network delays are not controllable by this system.)

3.2.2 Reliability

This section specifies the reliability requirements imposed upon the ParkSMART system.

3.2.2.1 - Reliability is defined as providing the user up to date, correct information when they need it. Information is considered correct when the parking spaces are accurately reported, and the information is no more than 30 seconds old.

3.2.3 Maintainability

This section specifies the maintainability requirements imposed upon the ParkSMART system.

3.2.3.1 - The ParkSMART system shall not need more than 3 hours of weekly maintenance.

3.2.3.2 - The ParkSMART system shall not need more than 7 days of annual maintenance (system maintenance different from weekly maintenance).

3.2.4 Environmental

This section specifies the environmental requirements imposed upon the ParkSMART system.

3.2.4.1 - The ParkSMART system shall not cause physical harm to users and non-users.

3.2.4.2 - The ParkSMART system shall not cause interference to external systems.

APPENDIX A - DEFINITIONS

Shall – expresses a requirement that is mandatory.

Should – expresses a requirement that is important but is somewhat flexible.

APPENDIX B – ACRONYMS

The following are acronyms used in this document:

GUI – Graphical User Interface
SRS – System Requirements Specification