**Software Requirements Specification**

For

**“Automated Smart Parking System”**

Under the Guidance of –

Dr. Bhupendra Singh

Prepared by

|  |  |  |
| --- | --- | --- |
| **Specialization** | **SAP ID** | **Name** |
| CCVT | 500082902 | Sagar Garg |
| CCVT | 500082698 | Saksham Kumar |
| CCVT | 500083415 | Nitin Dhadwal |
| CCVT | 500086293 | Budh Dhawan |



Department of Systemics

School of Computer Science

UNIVERSITY OF PETROLEUM & ENERGY STUDIES,

DEHRADUN- 248007. Uttarakhand

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1. INTRODUCTION

## 1.1 PURPOSE OF THE PROJECT

It has always been difficult for many vehicles to get a parking space during peak hours in places like hospitals, hotels, shopping centres, airports, universities, and exhibition and convention centres. According to surveys, up to 40% of all traffic is produced by vehicles looking for parking spaces. This is a severe problem that needs to be addressed, and smart parking systems are one of the greatest options for at least lessening the traffic congestion brought on by the aforementioned issue. This website provides data on the parking spaces in the lot that have sensors that can identify the presence of vehicles are occupied.

1.2 TARGET BENEFICIARY

Our project intends to improve the utilisation and administration of parking lots, as well as traffic and congestion caused by parking in cities. Recent research in major cities has demonstrated that there are various angles from which to view the problem of parking management. a large number of cars and trucks on the road. A frustrating issue for drivers who need to park their cars is the difficulty in locating a parking place. The majority of the time, drivers waste time and energy seeking for parking spaces and end up parking on the street. The worst-case scenario for clients is being unable to find a parking space, especially during busy times and holiday seasons.

## 1.3 PROJECT SCOPE

With the aid of a system like this, drivers may make wise choices that will ease congestion and maximise parking spaces. Nowadays, finding a parking spot has become a daily worry, which is where the idea for this project originated. With the evolution of technology, we have smartphones, sensors that detect the presence of any object and my idea is having a system where parking spaces are equipped with these infrared sensors that tells about the occupancy status of the parking spaces and a central management system that posts this occupancy status to a web application to guide the drivers in finding a vacant slot.

## 1.4 REFERENCES

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2. PROJECT DESCRIPTION

## 2.1 SWOT Analysis

**Strength**-

1. Easily accessible and useful.
2. Secure and Authentic.
3. Reduces manpower promotes automation.
4. Better traffic management in cities.

**Weaknesses-**

1. Reduction in jobs.
2. Suitable for low level.

**Opportunities-**

1. Learning about different Technologies.
2. Knowledge of backend & frontend development and IOT.
3. Knowledge about Sensors and scanners.
4. City traffic management.

**Threat**-

1. Cyber attack

## 2.2 PROJECT FEATURES

## A website built on the Internet of Things (IoT) called Smart Parking is used to find parking spaces that are open. This website employs an infrared sensor to identify vehicles (whether the parking slot is occupied or not). On the web website dashboard, the status (occupied/unoccupied) is shown based on the parking spot occupancy. The environment has sensors and gadgets integrated into parking spaces that send data on the occupancy status in real time. Drivers of vehicles can use their mobile phones or any attached infotainment system to look for parking availability. As a result, the motorist would locate an open area to park his car more quickly, saving energy and lowering air pollution.

## 2.3 USER CLASSES

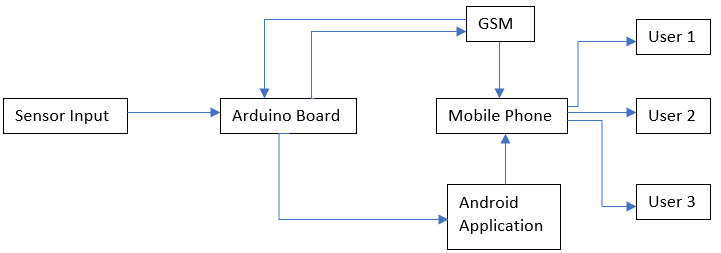
Our project will benefit all the users by making parking system a lot more convenient, less time consuming as user can see through the web interface about vacant space and parking records and reduces congestion helping in better traffic control and increases security by keeping logs every vehicle.

## 2.4 DESIGN AND IMPLEMENTATION CONSTRAINTS

* Networking issues
* Storage restrictions
* Complexity in integration

## 2.5 DESIGN DIAGRAMS

Activity Diagram: -



2.6 DATA STRUCTURE AND ALGORITHM

The data structure algorithm used in our model is FCFS i.e., First come first serve. Apart from that, when this project will be implementing to a bigger model with much more number of slots as compared to our current model, Dijisktra data structure algorithm can be used to reduce the time complexity. Dijikstra is Breadth first search algorithm which is used to find the neighbouring locations from a given source location. It will be used to determine the shortest path to the parking slots from the source of your car.

3. USER REQUIREMENTS

## 3.1 USER INTERFACE

We are using Microsoft Windows Operating System, Arduino IDE. So, These GUI websites provide interactive menus, toolbars, buttons, panes, containers, grids allowing easy controls with the help of various input devices like mouse and keyboard.

## 3.2 SOFTWARE INTERFACE

Software interfaces (programming interfaces) are the languages, codes and messages that programs use to communicate with each other and to the hardware. Examples are the Microsoft Windows Operating Systems. In this project we are using Java script and Arduino as programming Language.

4. NON-FUNCTIONAL REQUIREMENTS:

4.1 PERFORMANCE REQUIREMENTS

The proposed website model will be based on JavaScript and Arduino programming language and has to be implemented from IDE. The website will take initial load time depending on local hardware components like RAM & CPU cycles.

## 4.2 SECURITY REQUIREMENTS

There will be some user login by which we can provide security and the system keeps data of every vehicle entering the parking premises through various scanners and sensors increasing the security of the premises.

## SOFTWARE QUALITY ATTRIBUTES

Availability: Availability of our project depends upon the availability of individual services used in our project

Testability: Our project can be easily broken down into sub-components based on the services and device used. Each service of the device can be individually tested and verified for use.

MAINTAINABILITY - It is easy to maintain the system; the program is easy to upgrade for new features from time to time.

USABILITY – Our model is quite easy to use and navigation is quite simple. The analysis program is easy to learn and user friendly.

CORRECTNESS - The website’s functionality, internal calculations, and navigation should all be proper.

REUSEABILITY – The model can be reused with other states/places if required by changing some of the values and collecting appropriate data.

## APPENDIX A: GLOSSARY

1. SWOT Analysis: Strategic planning technique to help users or organization to identify strength, weakness, opportunity and threats related to projects.
2. CSS: Cascading Style Sheets.
3. HTML: Hypertext mark-up Language.
4. JS: Java Script.
5. Arduino.
6. Infrared Sensor.
7. Node MCU