**Software Requirements**

**Specification**

**For**

**IOT based Smart Vehicle Safety System**

**Version 1.0 approved**

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# Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
|  |  |  |  |
|  |  |  |  |

# 1. Introduction

## 1.1 Purpose

IOT based Smart vehicle safety system is mainly improvised for looking after the Set off data of a region to manage the Traffic along that area and implement various useful technologies which are been required by various persons like vehicle owners, pedestrians, police officers etc. Mainly the purpose of Smart vehicle safety system is to give the details which can be used and they can be implemented in their daily life.

## 1.2 Intended Audience and Reading Suggestions

This document is intended for project guide and experts. This project is used for to control accidents. Section 1.4 briefs about the scope of project, section 2 walks you through overall description of product like functions, operational environment design and implementation constraints, etc. Interface requirements is described in section 3. System features are listed in section 4 and section 5 lists non-functional requirements

## 1.3 Product Scope

Smart vehicle safety systems are a Analytical Module and provides **Traffic Incident Detection**, and real statistical analysis. Smart **Traffic Monitoring** can integrate with third party **traffic management** and **smart roadway systems** and hosts a feature rich product scope itself.

## 1.4 References

[1] “Towards Intelligence Transportation Cyber Physical Systems: Real-Time Computing and Communications perspectives” by Danda B. Rawat and Gongium Yan.

[2] “Cyber Physical system in Smart Transportation” by Dietmar P.F. Moller and Hamid Vankilzadian.

[3] “Cyber Physical System for Vehicle Application” by Kazunari nawa and Kentrao Oguchi

# 2. Overall Description

## 2.1 Product Perspective

The product is designed for the vehicle safety. It will serve as a tool for drivers to give an alert signal to the driver of the vehicle.

## 2.2 Product Functions

* Raspberry Pi: Power-1.5 W to 6.7 W

CPU-32bit /1.4 GHz

Memory-1 GB LPDDR2 RAM at 900 MHz

Storage-MicroSDHC slot

* Machine
* Processor

## 2.3 Operating Environment

The software will operate on any computer system with following minimum requirements: Hardware requirements:

* Intel i5 processor or its equivalent
* 8 GB physical memory
* Raspberry Pi
* IR Sensor
* RADAR Sensor
* ULTRASONIC Sensor

Software requirements:

* Ubuntu
* Python environment with all required libraries

## 2.4 Design and Implementation Constraints

s

## 2.5 User Documentation

After the completion of the product, user manual will be provided.

## 2.6.1 Assumptions

* Spatiotemporal data is required
* Sensors are working properly
* Alert signals are not damaged

**2.6.2 Dependencies**

* Weather
* Safety of the product

# 3. External Interface Requirements

## 3.1 User Interfaces

## The user interface, here is only the way in which the alert signal is given to the driver of the vehicle is the only way in which communication is done between the user and the system.

## 3.2 Hardware Interfaces

* IR sensor
* Ultrasonic sensor
* Raspberry pi
* Radar sensor

## 3.3 Software Interfaces

* Client : Windows series
* Data Base Server : DB2, Windows series
* Development End : J2EE, Oracle, DB2, Python (WINDOWS XP)

## 3.4 Communications Interfaces

Client on Internet will be using HTTP/HTTPS protocol.

* Firewall security is required for securing the server.
* TCP/IP protocol is basic need for client side.

# 4. System Features

The main objective of the system is to provide data analytical results from records. Thus after receiving the dataset, analysis must be stored at the storage.

## 4.1 Vehicle detection

#### 4.1.1 Description and Priority

Model will sense object or vehicle in critical mountain pass and the data goes to the system. This feature is of the highest priority it is the main objective of the system.

#### 4.1.2 Stimulus/Response Sequences

Vehicle detection if both the vehicles in same direction crosses the sensors at that moment the system will get response.

#### 4.1.3 Functional Requirements

Vehicle speed

Types of vehicle

# 5. Other Non-functional Requirements

## 5.1 Performance Requirements

System can withstand even though many no. of customers request the desired service. Access is given to any users

## 5.2 Safety Requirements

By incorporating a robust and proven DB2 UDB into the system, reliable performance and integrity of data is ensured. There must be a power backup for server system. Since the product is of 24x7 availability there should be power backup for server which provides the information. Every day the data should be backup even when the operation of a user is not successful i.e., while performing the operation power failure occurs then data should be backup.

## 5.3 Security Requirements

Sensitive data is protected from unwanted access by user’s appropriate technology and implementing strict user-access criteria. Facility of unique user number and Password in such a way that unauthorized user cannot log in. Operational rights for each user/terminal can be defined. Thus, a user can have access to specific terminals and specific options only

## 5.4 Software Quality Attributes

The system should be easy to use.

# 6. Other Requirements

TBD

# Appendix A: Glossary

TBD

# Appendix B: Analysis Models

TBD

# Appendix C: To Be Determined List

TBD