1. **Introduction**

This System Requirements Specification aims to mark out and show the design and architecture of Smart Driver Assistant from different aspects. It describes how the system is structured in order to supply the demands mentioned in this document. It is intended to give a hand to the reader to understand the implementation phase. The main audience for this document is the design and the development team of the Smart Driver Assistant project which is called TETRIS team. Development, testing, and design are all done by the same team.

* 1. **Scope**

As the phone is used almost by everyone, but no one has a tendency to use it as a tool to save their own lives or the other's lives. So why not take more benefits from scope of features of the phones and extend it for our own welfare. Our project is aimed to be used by everyone who owns an Android phone. Furthermore our application will perform users' command requests, i.e texting or calling. In terms of advantages we can say that the driver will not need to buy anything in order to use this application. The purpose of this project it to reduce the number of car accidents caused by drivers only because of their phone usage and the cases when they are sleeping. When the phone is used while driving, the driver's concentration is highly diminished, thus it creates a gap for making an error. In other cases when the driver has been driving for hours or is waked up early for job, it creates again a gap for making an error. This error could cause his/her death as well as other people who are driving or passing by. So we aim to take that phone and make it look like a special device which will serve as a guard of the driver and give the driver the opportunity to be fully focused and have a high probability of avoiding any accidents. Moreover crash detection algorithm will be implemented to make emergency calls in case of car accident. The only way of 'communication' between the driver and his/her phone will be his/her voice and the application's voice.

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**Literature Review**

4.1 Techniques for Detecting Drowsy Drivers Possible techniques for detecting drowsiness in drivers can be generally divided into the following categories: sensing of physiological characteristics, sensing of driver operation, sensing of vehicle response, monitoring the response of driver.

4.1.1 Monitoring Physiological Characteristics Among these methods, the techniques that are best, based on accuracy are the ones based on human physiological phenomena [9]. This technique is implemented in two ways: measuring changes in physiological signals, such as brain waves, heart rate, and eye blinking; and measuring physical changes such as sagging posture, leaning of the driver’s head and the open/closed states of the eyes [9]. The first technique, while most accurate, is not realistic, since sensing electrodes would have to be attached directly onto the driver’s body, and hence be annoying and distracting to the driver. In addition, long time driving would result in perspiration on the sensors, diminishing their ability to monitor accurately. The second technique is well suited for real world driving conditions since it can be non-intrusive by using optical sensors of video cameras to detect changes.

4.1.2 Other Methods Driver operation and vehicle behaviour can be implemented by monitoring the steering wheel movement, accelerator or brake patterns, vehicle speed, lateral acceleration, and lateral displacement. These too are non-intrusive ways of detecting drowsiness, but are limited to vehicle type and driver conditions. The final technique for detecting drowsiness is by 12 monitoring the response of the driver. This involves periodically requesting the driver to send a response to the system to indicate alertness. The problem with this technique is that it will eventually become tiresome and annoying to the driver.

* 1. **Overall Description**

In this section of SRS document, general description of the factors which influences the system and its requirement is involved. It supplies with diagrams and models which gives a view of how the Smart Driver Assistant 5 system is going to behave, respond and interact with the customer.

3.1.2 SYSTEM REQUIREMENTS This defines how the user expectations will be met by the system, they are classified into:

3.1.2.1 FUNCTIONAL REQUIREMENTS The system should be able to meet the following functionalities: 1. To detect drowsineness among drivers 2. Issue alert when drowsiness is detected

3.1.2.2 NON- FUNCTIONAL REQUIREMENTS In order to meet the functional requirements while operating in constrained environment the system had to meet several non-functional requirements that are critical and core to its performance. The non-functional requirements mainly touch on the systems abilities in embedded environment