

ANDROID BASED AUTOMOBILE OVER-SPEED WARNING SYSTEM

INTERNAL PROJECT PROPOSAL

SUBMITTED TO

SSN COLLEGE OF ENGINEERING

(For Financial Assistance)

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AUGUST 2015

<u>PROJECT TITLE</u>	ANDROID BASED AUTOMOBILE OVERSPEED WARNING SYSTEM
<u>DURATION</u>	12 months
<u>TOTAL COST</u>	INR 9000
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INTRODUCTION:

These days a lot of people lose control of their vehicles, be it a two wheeler or a four wheeler and cause accidents. One of the major reasons for this is that many people never care to look at the speed sign boards and stay within the speed limit. The solution which we intend to provide is to deploy a simple android application which uses the capabilities of the sensors incorporated within the android devices like Global Positioning System (GPS), to track the speed at which the vehicle is going and use Google's cloud data from the **Roads API** to access the speed-limit data for the area the user is in. Using these two features we intend to warn the user whenever the speed limit is exceeded with/without their knowledge.

OVER SPEEDING

While commuting via a two wheeler or a four wheeler is the fastest way to get around in a town or a city, it is also one of the most dangerous ways to do so. Despite the government setting up **SPEED LIMIT SIGNS**, not many bother to look at them and slow down. This can become a problem especially when automobiles try to speed up in and around the residential areas, institutional areas etc. This small negligence can manifest itself in a form that could take a heavy toll on life and property. It is estimated that roughly 100-200 road accidents take place and 22 lives lost every hour in India.

HOT-LINE

Most of the people, travelling to newer locations on their vehicles are bound to encounter some mishaps with their vehicles. They have the problem of finding a place to crash in for the night, a place to refill their supplies like water etc. Because of such complications people are easily fed up. The fact is because there is not a single app that could provide us with all these features.

MOTIVATION

We are motivated by the fact that the process of warning every commuter who tries to over speed can be **AUTOMATED**. Since **ANDROID** devices are used by almost everyone these days, a system that could automate the process of warning the users seemed like a feasible solution. Initial investigations revealed that alerting the user with a beep or vibration can be more effective and precise than a sign board. The process of providing location based hot-lines seemed a viable solution to the problem getting the people comfortable in the new environments.

OBJECTIVE

The main objective is to warn the user, when he/she speeds up in a zone which has restricted limits. With such a system, the user can identify that he/she is over-speeding and has to slow-down. In the long run we plan to provide our users with a travel companion, so that they can relax while they are travelling.

EXPERIMENTAL SETUP AND PROCEDURE

The experimental setup required for this project mainly relies on the speeding simulations in an android handheld device. The project requires a single ANDROID handheld device, with 2G/3G connectivity and a GPS. This single device can be used by the user on all his vehicles, so there is no need for a separate device on each vehicle. The project also requires a Near Field Communication (NFC) enabled device as an add-on feature so that the user can activate the application only when he/she is commuting via a two wheeler. A database for providing location based hotlines.

METHODOLOGY

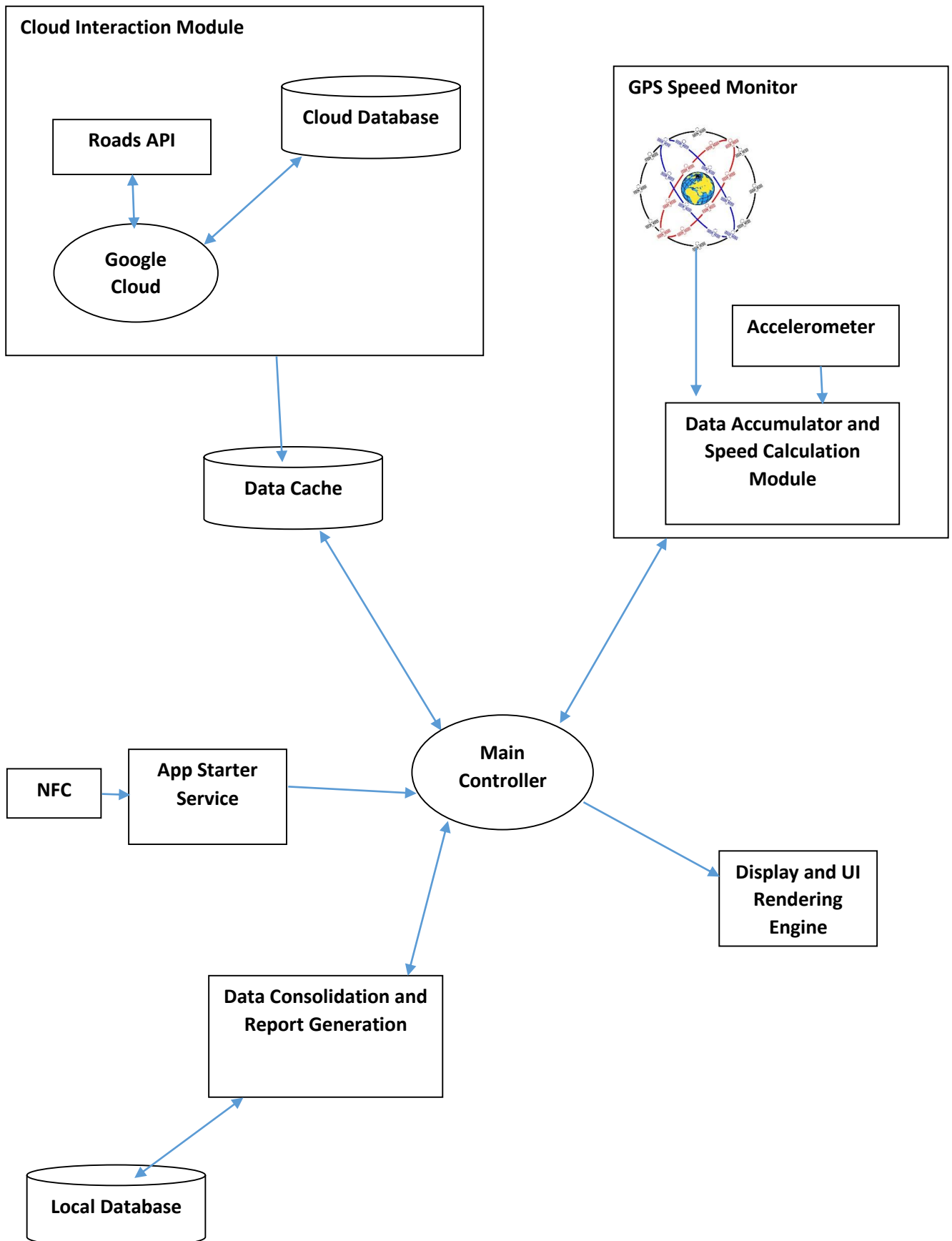
The following procedures are to be adopted for construction of this system.

- Getting an API key from Google for Roads API and setting up the android project
- Developing the core modules (part-1) to calculate the commuting speed
- Developing the core modules (part-2) to get the speed limit data from the Roads API
- Adding additional features to the application like hot-line etc.
- Testing the modules and debugging
- Developing the UI
- Integrating the core modules in the UI
- Real time testing and optimizations

DELIVERABLES

- An automated travel companion
- A GPS based speed engine
- An android application which can be launched in Google Play Store
- A location based hot-line

MODULE DIAGRAM



MODULES

- Main Controller
- Cloud Interaction Module
- GPS Interaction Module
- NFC App Starter Service
- Data Consolidation and Report Generation Module
- Display and UI Rendering Engine

MODULE DIAGRAM DESCRIPTION

The GPS module monitors the location as well as the velocity of the device. This data is sent to the GPS monitor module which in turn is sent to the main controller. The NFC module establishes a link with the closest NFC in proximity. The app starter service then enables the NFC link by sending start signal to the main controller. A local database is maintained to consolidate the data generated by the device. This data is sent to a data consolidation and report module which in turn collaborates with the main controller. A display controller module is used to render a UI to the app. Google cloud module is used to fetch data from roads API and cloud database. A data cache is used between the main controller and the cloud module to facilitate offline use of the data available in cloud. Finally, the main controller is used to coordinate all the modules in the application.

BUDGET

<u>Item</u>	<u>Cost</u>
Google Roads API	INR 3000
Cloud Services	INR 5000
NFC Tags (INR 500 * 2)	INR 1000
TOTAL	INR 9000

TIME FRAME

Month	Work
1	Work on getting the API's from Google Work on establishing the cloud databases Testing the API's and database connection on an android phone.
2	Work on creating the schema diagram Creating the database tables and testing them
3	Work on interfacing the GPS to get the commuting speed of the user Optimizing the sensor values
4	Work on the module to get the speed limit data from Google API's and interfacing them Work on the module to raise alarm when the speed limit is exceeded. Creating the algorithm to neglect small and short-lived changes.
5	Creating the UI and integrating the above modules in it. Real-time testing and debugging using an actual vehicle
6	Populating the databases with the local values.
7-8	Writing modules to access the database and retrieve hot-lines based on the location.
9	Integrating the data with the UI Real-time testing
10-11	Creating a new local database to store user history. Collecting their data and displaying them as reports in the form of Graphs, charts, tables
12	Final round of testing and debugging

SCOPE FOR FUTURE WORK

- In future this system can be extended to other devices like Windows Phone, iOS and the like.
- This system can also be extended to a wearable device.
- The data from this application can be supplied to government, so that they can identify the areas where the traffic rules are violated and plan counter-measures accordingly.
- In future we plan to add a heart-rate monitor modules (available in android wearables) to call the local ambulance service using our **HOTLINE** service.