

# An Analysis of Vehicle Diagnostic and Tracking Tool Using Android

Prof R.Suryawanshi, Ms. Ria Sayaji, Mr. Jaideep Patil, Mr. Parth Kulkarni, Mr. Bilal Sayyad

**Abstract**— The use of mobile phones while driving is one the most dangerous and widely seen causes of fatal accidents .The main aim of our project is to develop a system to keep a track on the person driving the vehicle and ensuring he does not evade from stringent laws enforced by the government and put his or passengers travelling with him in danger. This novel and easy technique facilitates the owner of the vehicle to control ignition until and unless the driver is ready to drive with safety (eg. driver is not under influence of alcohol, whether he is using seat belt, has he held the steering, authenticated himself etc) To meet the requirements of an vehicle diagnostic and track tool system this architecture integrates Global Position System (GPS), Bluetooth and a Microcontroller. The system can be used to monitor performance of the vehicle and tracking by communicating the obtained data via Bluetooth to a mobile phone and also storing it in an database. Diagnostic details can be obtained from an on board diagnostic system (OBD). The Bluetooth gives quick updates to the owner of the vehicle and data stored in the database can be accessed whenever owner wants either to check for vehicles performance , drivers performance or any other details.

**Index Terms**— Vehicle diagnostic, Vehicle monitoring, Vehicle tracking

## I. INTRODUCTION

The growing number of fatal accidents due to driver's negligence or not following safety precautions makes it necessary to develop a system which ensures safe driving which will in turn ensure safety of driver as well as co passenger's. A system which will start ignition only if driver passes test for driver authentication , alcohol consumption and seat belt. The driver will be allowed to start ignition only after he validates himself. While the vehicle is in motion it will capture values for speed control , it will ensure engine temperature is maintained, and the touch sensor ensures driver is holding steering while driving. Another feature of the system is the drowsiness sensor which starts a buzzer or starts interaction with the driver so he does not feel sleepy.

**Manuscript received September 23, 2014 .**

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To access diagnostic data of the vehicle as early as possible is important to avoid serious faults.[1] Early detection and correction will increase safety up to a very large extent. Using GPS (Global Positioning System) The location of the vehicle can be obtained with the help of Longitude n longitude values. Once the right defects are obtained then instructions can be sent to the driver as to how to handle the situation.[1][2]

## II. LITERATURE SURVEY

**A) Android-Based Universal Vehicle Diagnostic and Tracking System** [1]: This system provides a very user friendly and low cost hardware for vehicle diagnostics. The mobile device which is android based helps in creating a on board vehicle diagnostic system. The mobile device application interacts with the hardware unit with the help of Bluetooth and acquires vehicle parameters obtained from the ECU of the vehicle. These values can be viewed by the driver of the vehicle as well as the server from which the vehicle can be administered by the owner of the vehicle or can be stored in a database for further maintenance.

**B)Design of Intelligent Mobile Vehicle Checking System Based on ARM7**[2]:This system uses a mobile checking device as well as video capture and wireless communication for vehicle diagnostics. This system is mainly designed for the traffic auditing department to keep a check on vehicles and the person driving it. The advantage of this system is that it is small in size ,less costly ,fully featured and powerful.

**C)Intelligent Vehicle Monitoring System using Wireless Communication**[3]: This system is mainly designed for cops in order to monitor whether the driver of the vehicle is using a mobile device or not while driving. This system can be fitted into the vehicle and requires some special setups. This system can help in saving human lives by reporting use of mobile phones while driving which will also set a bench mark.

**D)IWAY: Towards Highway Vehicle-2-Vehicle Communications and driver support**[4]: This system is like a GPS tracking tool which shows road infrastructures which is useful for drivers.

**E)Microcontroller Based Neural Network Controlled Low Cost Autonomous Vehicle'99**[5]: This paper describes a system which makes use of neural network which is used for transporting light weight equipments inside a university campus. The system has a number of sensors with the help of which the vehicle moves around the campus avoiding obstacles and reaching its destination. The system involves a number of modules which makes it less complex. This low

cost solution can be used within wheel chairs to help disabled people.

**F)Optimal Scanning Strategy for Vehicular Wi-Fi** [6]: This system uses the greedy scanning strategy that obtains scanning history and vehicle speed into account for vehicle Wi-Fi. Simulations are used to find open AP's in fewer scans. This helps travelling vehicles to transmit and receive data faster.

**G)Vehicle Speed Limit Alerting and Crash Detection System at Various Zones** [7]: This paper is designed in order to avoid accidents and alert the drivers about speed limits. Many systems provide road safety and has proposed various methods for speed limitations and accident avoidance .But to actually control the vehicle's speed in real time is very difficult. So instead of controlling the speed the driver is alerted about his speed so that he can reduce his speed to a safe limit. When the driver enters the speed limit zones his speed details will be sent through a message to the traffic police and even if an accident occurs the vehicles location can be traced easily.

**H)GSM Enhanced GPS Based Vehicle Tracking System** [8]: This paper has proposed an anti theft system which can track a lost vehicle. Vehicle can be traced using GPS. Other sensors can be installed within the vehicle that is steering lock, tire lock and gear lock. This system replaces the old traditional system by using short message service which will send a message to the owner. The only disadvantage of the system is its poor network coverage in areas like basements or tunnels. The owner receives a message every time the car is unlocked and to stop the theft the user will send a command through SMS. This system not only gives the vehicles location but also prevents theft.

**I)Vehicular Tracking and Disaster Management in Hilly Areas using RFID**[9]: The vehicle management system is difficult to maintain in hilly regions as it is disaster prone thus this system uses tracker booths as well as central tool booth's to communicate disaster warnings. This system uses a Arduino Microcontroller which is installed into these booth's to signal warnings and status of traffic.

**J)Wireless Sensor Network Architectures for Intelligent Vehicular Systems**[10]:In this system a multi-tiered architecture is used. The architectures are WNS based for Intelligent vehicular system (IVS).This provides more security. However WNS can lead to sending wrong data to travelers regarding condition of the road. Also intruders can divert traffic to robbery prone areas so security is a major concern.

**III. EXISTING SYSTEM**

The on board diagnostic system (OBD) was used in the united states in year 1960 after the number of vehicles on road increased. Due to increased amount of air pollution in 1967 several attempts were made to interface the vehicles ECU to monitor and control vehicles engine byproducts. This version had low baud rates while later versions had higher[1][3].Later in 1987 vehicles sold in California had to have some basic OBD capability[1] [3].In the year 1994 California Air Resources Board was made mandatory in 1996 for all cars in US[1].

In Germany the Assets Telematics offers GPS devices for tracking with extended warranty .All devices are configured and tested .Their tracking system provides:

- Real time tracking of customer vehicles.
- Current location updates.
- Vehicle path history.
- Vehicle map location.
- Trip information for entire fleet.
- Daily trip records.
- Daily Speed records.
- Driving hours.

There are a various number of hardware components available to install in vehicles for tracking .They are much helpful however no such system is available with a combination of hardware and software components for vehicle diagnostic and tracking .Our system will provide a combination of both.

**IV. PROPOSED SYSTEM**

**A)System Architecture**

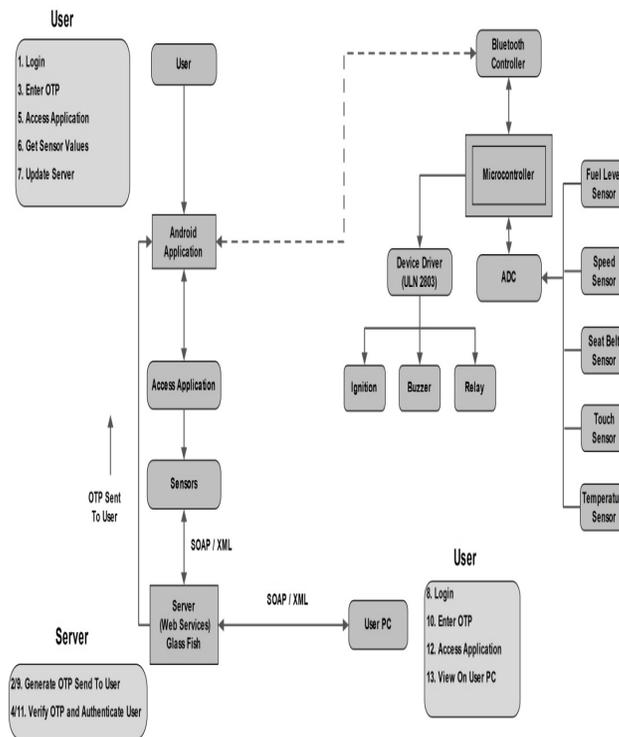


Fig 1: Architecture of System

It monitors the driver on all his activities whether he is under influence of alcohol ,whether or not he is using the seat belt, touching the steering or temperature of the vehicle is normal

or no. The ignition will start only after driver validation after he receives a unique OTP (one time password) with which he login's. The system will be installed inside the vehicle in a safe location. The system aims at finding law breakers and avoid unwanted situations. Our system is divided into the following units:

#### A. Server, Database

Here all the diagnostic information will be stored. Which can be monitored whenever needed by owner of the vehicle to check performance of driver and vehicle. This information will be sent to the server via internet through an android phone.

#### B. Android Phone

The android phone will be used to display all the data. the android phone will have an application which helps driver to authenticate himself and view details of the vehicle. Basically it will be used as a display device

#### C. Sensors

To obtain diagnostic values. They include:

i. **Speed sensor [3]:** The speed sensor will track speed of vehicle and ensure it does not exceed a particular limit. If it exceeds a particular limit it will raise a buzzer or some kind of notification will be given to the driver to reduce speed.

ii. **Fuel Level Sensor[3]:** The fuel level sensor makes sure that the fuel level is maintained and the level is not under a particular level. This sensor makes sure the driver fills in amount of fuel as said by owner and there is transparency

iii. **Seat Belt Sensor[3]:**The seat belt sensor is based on push button. This sensor makes sure driver is using his seatbelt and if not he will be notified to do so.

iv. **Touch Sensor :**This sensor makes sure driver is driving with both his hands touching the steering. If not a buzzer will be alerted.

v. **Temperature Sensor[3]:**In order to avoid un usually heating of the vehicle this sensor will raise an alarm and necessary precautions will be taken.

**D. GPS Tracking[3]:**The geographical positioning system will give the position of the vehicle as to where it is present. It will provide its latitude and longitude values.

**E. Microcontroller[3]:**The microcontroller is a on chip functional unit. It is made up of a processor core, memory and programmable peripherals.

### V. CONCLUSION

The main aim of our system is to avoid accidents with a combination of cost efficient hardware unit and a user friendly android based mobile application to create an on board vehicle diagnostic system. The mobile application will interact with hardware using Bluetooth which will be sent on a server for monitoring. Our project also provides speed control diagnostics for drivers who are over speeding. This will avoid the increasing number of fatal accidents. If any of the safety rules are not followed a buzzer will be raised and if the driver is under the influence of alcohol the

ignition will not start. This vehicle equipped with various sensors is capable of inducing self safety by alerting the driver whenever something goes wrong. Instead of controlling the vehicle directly our system aims at alerting the driver whenever necessary.

### VI. APPLICATIONS AND FUTURE SCOPE

The main aim of our system is to avoid accidents with a combination of cost efficient hardware unit and a user friendly android based mobile application to create an on board vehicle diagnostic system. The mobile application will interact with hardware using Bluetooth which will be sent on a server for monitoring. Our project also provides speed control diagnostics for drivers who are over speeding. This will avoid the increasing number of fatal accidents. If any of the safety rules are not followed a buzzer will be raised and if the driver is under the influence of alcohol the ignition will not start. This vehicle equipped with various sensors is capable of inducing self safety by alerting the driver whenever something goes wrong. Instead of controlling the vehicle directly our system aims at alerting the driver whenever necessary.

### ACKNOWLEDGMENT

We take this opportunity to thank all the people who have helped us in completing our project, without whom the completion of this project would not have been possible. First of all we would like to thank our esteemed guide, Prof.R. Suryawanshi, for his guidance at all the times and that he provided his support and guidance without complains at any time of the day and also for the bright ideas and inputs that they gave to the project.

We would also like to thank Prof. S. B. Chaudhari (HOD COMPUTER) for his keen interest and Cooperation towards our project. We wish to express our sincere gratitude to TCOER, Pune, for providing facilities like Internet and Library. We would also like to convey thanks to all those who directly and indirectly helped us in completing project.

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## **An Analysis of Vehicle Diagnostic and Tracking Tool Using Android**

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