

# Study of Connected Car services using cloud

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**Abstract** - In the fastest growing generation the automatic concepts plays a major role. In every field the automatic is developing a lot. In that the connected car technology is one among them. It takes a major part in the automotive and academic industries. In this technology the driver will communicate with the other driver by using the internet access. In different countries like Europe, USA and Japan the many technologies are using under this connected car. Many researches are undergoing to get what are all the new feature are to be added for the betterment of the driver and car. This paper explains about how the communication is to be taken place between the drivers with the android phone experience.

**Key Words:** V2C, IVI, connected car, V2V

## 1. INTRODUCTION

Internet of things has created a lot of buzz in nowadays technology, in the current evolution it is playing a vital role and developing a lot. So, the information and communication technology has introduced the new concepts of connected cars where it helps in the betterment of the driver and the car. Connected car technology creates a new business and ecosystem of partnership between providers of hardware.

The use of cloud is one of the helpful method for connecting the cars because, 1) to overcome the storage in the vehicles. 2) Hard to implement in a single system which is installed in the car or mobile [2]. According to the recent trend the Fiat and Hyundai companies are joined hands with the Google company to give the good service. It is a big challenge to develop a cloud based technology in the cars. As the cloud services are to be used in the various methods therefore their performance is highly depended on the resource management and the capacity to connect. The cloud services are mainly depended on the traffic, weather conditions and coverage areas.

In this paper the main aim is to show how the cloud services are to be helpful in giving the alertness to the driver and give information's such as weather conditions, emergency attentions, location information's and view the map. If the one driver is going along in one particular path then in that place if the weather conditions are not good then he can update in the cloud that the path in this particular area or the path is not good then the other drivers who are going in that path can change their way and they can reach safely and he can also update that the sudden accident is happened and the roads are jammed use other way to travel. The next situation is when the road is full jammed and then the

emergency service like ambulance is arrived the nearby driver can update the information that the emergency give a way for ambulance. While travelling in a way if the car door is not properly closed then the driver will give message to that driver that your door is not properly closed and if fuel tank door is not properly closed then without disclosing the personal information and by this we can view the map by that directions to reach the destination will be helpful.

The vehicle to vehicle communication uses for the latest technology that the driver will get the more information and helpful for the betterment of the enjoyable travelling.

## 2 LITERATURE SURVEY

### A. Connected Car

A connected car is one of the technology where that is equipped with internet accesses and they use the wireless local area network technique. This one is helpful to allow internet access inside and outside of the car. General Motors was the first automaker to develop the features to market called Onstar in 1996. The main purpose of the connected car is providing the safety and security the passengers and the driver too. In this initial the onstar worked with voice but when the cellular system is used then GPS method will be used. There are mainly two methods to be used they are 1) Single vehicle application where there is only one car which will be connected to the server or through cloud where the information will be retrieved and perform the tasks according to that. 2) The connectivity between the two vehicle and perform the particular operations to give information about the road and the maps.

Connected car in the early days the technology is all about vehicle monitoring systems, location tracking. The connected car technology contains 6 different categories, they are:

- 1) Mobility management: In this driver will be safely reached to the destination quackery, safely and cost effective manner like current traffic information, parking lot, optimized fuel.
- 2) Vehicle management: It functions the driver to reduce the operating cost and improve in giving the information like vehicle condition, service remainders and remote operations.
- 3) Safety: It functions about the safety measures about the driver and the co passengers.
- 4) Entertainment: In this category the co-passengers are to be maintained in a particular mood and the moods will be

detected by the system according to that the music's will be played.

5) Driver assistance: In this category the information about the roads and the information about the traffic for the driver will be given.

6) Wellbeing: It functions about the driver's fatigue, ability and the driver condition while driving.



Fig.1 Connected car system

**B) ITS application:**

ITS stands for Intelligent Transport System are divided into three main categories according to their functions, such as safety, efficiency and comfort application.

In the Safety application there are 3 categories where it contains collision avoidance, road sign notification and incident management. In the collision avoidance safe distance and intersection collision avoidance are the functionalities to be added. In road sign notification vehicle signage and curve speed warning are the major categories. At last in the incident management there are 2 methods they are emergency vehicle warning and post-crash warning [1].

In efficiency application there are 2 major applications they are: traffic management and road management. In the traffic management application, it is divided into two sub divisions they are intelligent traffic flow control and free flow tolling. Another application in the efficiency is road monitoring and this application is subdivided into two components they are like vehicle tracking and tracing [2].

In comfort application also 2 applications are there they are entertainment and contextual information. In the entertainment subdivisions are like distributed games and music systems and in the contextual information is about restaurant information and the parking slots in the road or in the tourist places [1]. These are the various application information's that provided by the connected car technology.

**C. Vehicular Communication Technologies:**

The wireless communications are the fastest growing technology where it is more adoptable and portable. This will give the safety to the driver and passengers. This

gives various information like proving the internet access for inside and outside of the system and these are to be helpful in communicating between two drivers and help them in providing information's like emergency messages, weather conditions. There are various technologies are to be introduced to develop the communications that are to be explained in the table given below

features	Cellular technology	Wi MAX	DSRC	zigbee	Bluetooth
standard	3G / 4G	IEEE 802.11p	IEEE 802.11p	IEEE 802.15.4	802.15.1
coverage	15km	5km	1000m or 305m	10m to 75m	1,10 and 100 m
network	Full mobile	P2M	Point to point	mesh	Point to point
Bit rate	<2 to 100Mbps	75Mbps	6 to 27Mbps	20 to 250 Mbps	53-480 Mbps
references	[11][12][1]	[14][15][1]	[12] [1]	[11] [1]	[13][1]

**3 PROPOSED SYSTEM**

The mobile in car services has developed in nowadays but providing the cloud services to that is the latest technology. This application enables the driver by providing the various features like emergency alert, messaging the other drivers for their car condition, giving the weather conditions and view the map. In this technology the driver's personal information like phone numbers are not needed. The vehicle number will be registered in the cloud while travelling to the particular area.

Fig 2 shows how the drivers will get the particular information and what all are the needs that are to be required for the representation of the system. It also helpful for giving the moods of the driver and the alertness will be given or it will display the message to the driver. The development of the proposed system will consists of segments like software, cloud services and connectivity.

The fig 2 consists of how the system will be connected to the services and hoe the services are to be divided and firebase technique helpful. The firebase is a cloud messaging and it is a platform solution for messaging solution for android and web applications. The firebase technology is free of cost.

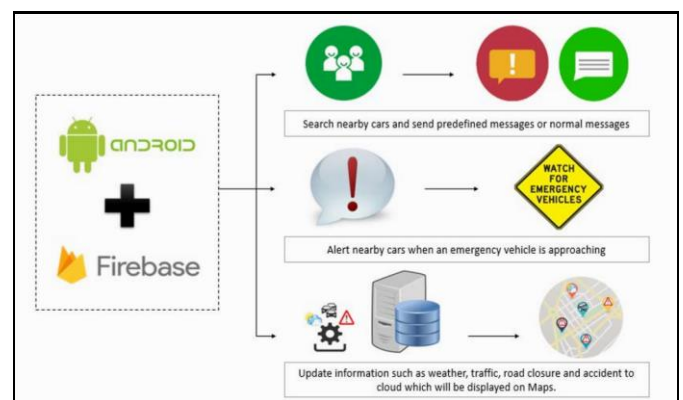


Fig 2 mobile in car services.

The various features that are developed in the system are:

### 1) Find nearby cars

The find nearby cars is useful to find the cars which are travelling in the same way and communication with them, and they can make carpooling also. By this technique if the door of car is not properly closed and any leakage of the oil in the car then the other drivers will check their car registered number and they can communicate with them and help in saving the fuel. It also helpful when the indicator light, signal lights is not working properly then they can also exchange the information that your car light is not functioning properly.

### 2) Emergency Vehicle Warning

This is the major feature of this work where it will give information about the emergency vehicles like ambulance. If there is a traffic jam in the area then the ambulance service is needed then other driver will update the information that the emergency service is needed so clear or the road or give a space for the ambulance.

### 3) Locate Information

It is one of the feature where it gives the information like weather condition, road closure and accidents in that particular areas. If the driver is using the same application he can view the point to that particular area where the accidents are happened.

### 4) View Map:

It is one type of the feature where it will provide the route map for the travelling and easy by giving the shortest path for the driver.

### 5) Cloud Services:

In the software as a service model, user gain access to application software and databases. Cloud provides manage the infrastructure and platform that run the application. This is sometimes referred to as "on-demand software" and is usually priced on a pay-per-use basis or using a subscription fee". Building a backend is very much important where it is helpful in saving the information that are updated by the other drivers.

Mobile in car connected services has features like database that is needed that is helpful in saving and retrieving the data to the system. The most using database is the firebase where it worked in the android platform and it is easy to retrieve the information's.

## 4 IMPLIMENTATION

Fig 3 explains about how the system is working and how the embed system is working and what are the helpful of the

system and proving features. The system consists of the car which is connected with the internet facilities and it must be connected with the android phone where the particular must be installed. The cars must be connected with other cars to communicate with each other and they are to be connected through that software.

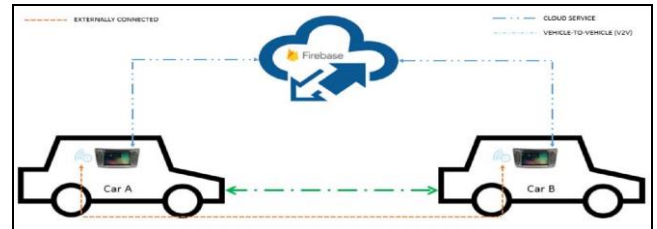


Fig 3 Cloud based connected cars

The hardware components required are GPS system and car with the internet connection. The software interface consists of various display information like settings, nearby cars, chat history, emergency alertness, view map and locate information.

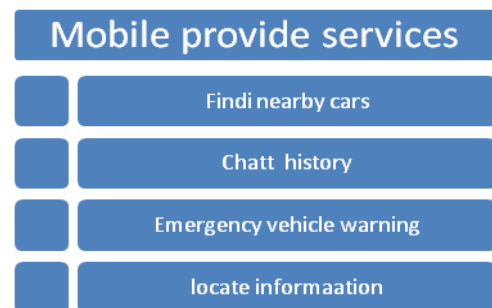


Fig 4 system interface

As shown in the fig 4 the interface will also consists the interfaces for the settings and view the map. These are user friendly interface by this the user will interact easily and there is no any interrupts while driving.

By comparing to the other the hardware cost will be cheap and it will be easily installed in the car. Nowadays in every car the GPS technology is installed. The major drawback is while travelling in the area where there is no network like forest areas.

## 5 CONCLUSIONS AND FUTURE WORK

The main purpose of this work is to give a very good platform the drivers so that they cannot make any harm for their life and providing the various needs like chatting with other drivers so that they can aware of their car functioning's and alerting about the emergency vehicle needs for giving the importance for other life's too, locating the information about the accidents, weather conditions and viewing the maps for easy and shortest path for reaching early.

The feature work is like it should automatically detect by the drivers speech and perform the operations that what the driver will tell. Theanother work is that mobile phone will be replaced with the dash board so that battery of the phone is saved.

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