

# CAR MONITORING AND SAFETY SYSTEM

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**Abstract:** This Project presents autonomous accident prevention with security enabling techniques, speed control and accident detection system. The main objective is to design an PIC18F4520 controller to monitor the zones, which can run on an embedded system and to automatically locate the site of accident and alert concerned people. It should be done automatically as the person involved in the accident may not be in a circumstance to send the information. The proposed system is composed of two separate design units: transmitter unit and receiver unit. Just before the vehicle is in the transmitter zone, the vehicle speed is controlled by receiving the signal from the smoke or alcohol sensor. For this, sensors can be kept at a few meters before the zone. . Accident detection system comprises of GPS and GSM in cell phones.

The main unit of this project is an "Alcohol sensor". If the person inside car has consumed alcohol then it is alcohol detection is done by the sensor. Sensor gives this signal to a comparator IC. The output of comparator is connected to the microcontroller. Microcontroller is the heart of this project. It is the CPU of the complete circuit. Microcontroller gives high pulse to the buzzer circuit and the buzzer is turned on. At the same time a relay is turned off. Due to this the ignition of the car is deactivated.

**Index Terms – Embedded system, Smoke detection; alcohol detection; RFID; GSM;**

## Introduction :

The total car sales rose to 4.6 million units in India alone by the year 2016 with the increase in number of cars along with other transportation vehical. In now days we know that there are lot of accident occurring due to the some problem like alcohol, smoking, smoke in engine, Break fail system, low visibility etc.

The main purpose behind this project is "Drunk driving detection". Now a days, many accidents are happening because of the alcohol consumption of the driver or the person who is driving the vehicle. Thus Drunk driving is a major reason of accidents in almost all countries all over the world. Alcohol Detector in Car project is designed for the safety of the people seating inside the car.

We can implement a device or gadget that can save life. IN this project we using sensor to detect the above said problem and get the solution for the problem. When we detect the problem we can stop the car or vehicle and save the life of human beings.

We know that there are lot of car on rent in India. The all owner can't trust their Driver when the car is on rent. So using advance technology owner can monitor his vehicle, using this technology he can find it anything wrong is happening in the car

Using this system we are not only save the life but also stop the crime by sending the message to the owner and in future we can send this message to police. Using this system we learn about interface of various modules with the microcontroller and also we learn about the sensor interfacing.

## I. RELATED WORK

The automobile safety is the study and practice of design, creation, equipment and regulation to minimize the incidence and consequences of automobile accidents. There are two type of safety such as active and passive safety. Active safety is used to support in the prevention of a crash while passive safety to components of the vehicle that help to protect occupants during an accident. Airbags, seat belts, Anti-lock braking system, Electronics stability control, Traction control system, Daytime sssslight system are the general example of passive safety of Vehicle in the existing system [1].

One of the most widespread car sharing initiatives is Zip car [2], started in the early 2000's in the US. This service, which is available in more than 90 US cities and also in London, offers different kinds of ICE or hybrid cars to registered users, who reserve vehicles via web or via phone. Users are provided with RFID cards that are used to open cars, and the vehicle keys are physically chained to the car, together with a fuel card; users can also locally lock/unlock the car using a Smartphone app, though the interaction does not occur directly with the car, which is opened remotely by the control center when an SMS is received.

A car sharing service similar to Zip car is the Swiss Mobility Cars haring [3], started in 1997. In 2010 Mobility operated about 1200 stations in 450 locations in Switzerland. As for Zip car, upon registration users receive RFID cards that are used to open the cars that are reserved online or via phone. The keys are in the vehicle, but not chained to it, so doors can be locked/unlocked using the vehicle key itself. A simple interface available in the car allows users to modify on-the-fly the trip by extending or stopping the reservation. A fuel card is onboard to refill the car, if needed.

### II. BLOCK DIAGRAM

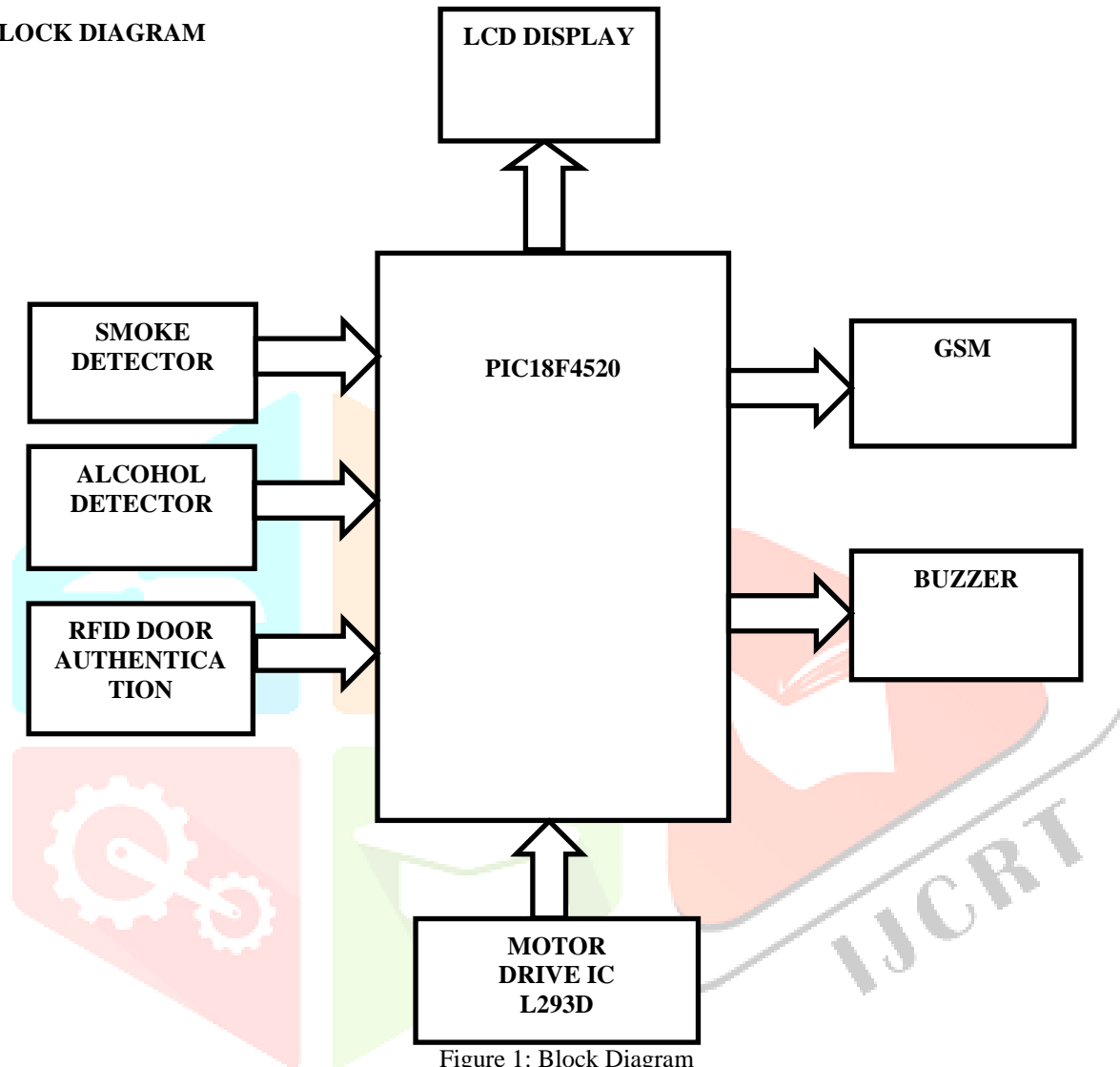


Figure 1: Block Diagram

### III. SYSTEM DESIGN

This section describes the high level architecture for the car monitoring and safety system:

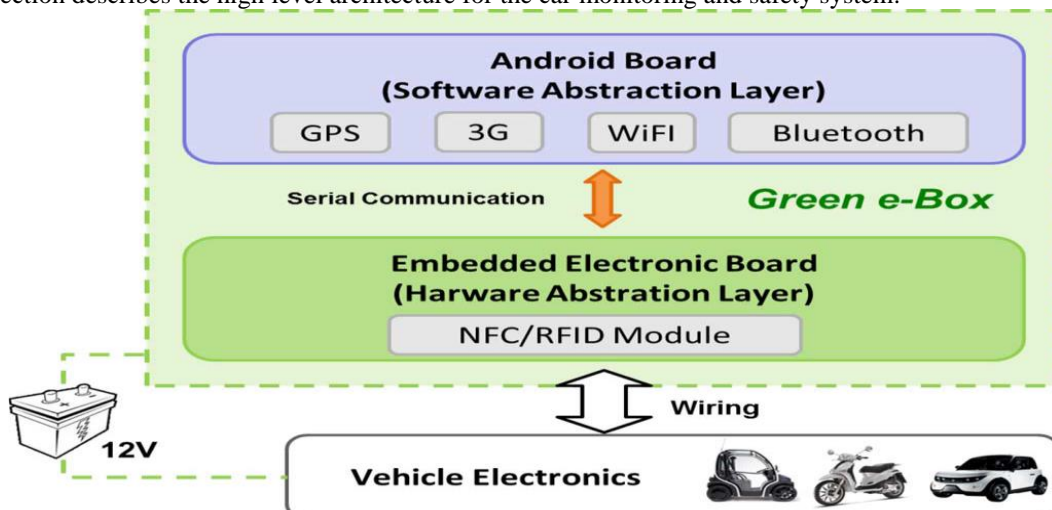


Figure 2 Car monitoring and safety system

Talking of the above mentioned figure, it depicts a parking area where our parking system is implementation along with the way in which communication happens between various modules. The primary actors that constitute the parking system are:

□ Alcohol and Smoke Sensors: For our Safety system we have made use of sensors like Infrared. The Alcohol and gas sensor senses the alcohol, smoke and determines whether alcohol or smoke is present or not. In this case we are using alcohol and smoke sensors to detect the presence in car. The sensors are connected to a 5V supply either from pic18F4598 microcontroller or an extra source.

□ Processing Unit: It comprises of Pic18F4598 microcontroller which is a processor on chip. The processing unit acts like an intermediate between the sensors and GSM are connected to the processing unit. A single microcontroller unit comprises of 26 GPIO pins i.e. 26 different sensors can be connected to it. It has 12MHz crystal for system clock and 32 KHz crystal for RTC. It has power on reset circuit with MCP130T brownout monitoring chip and power decoupling capacitors.

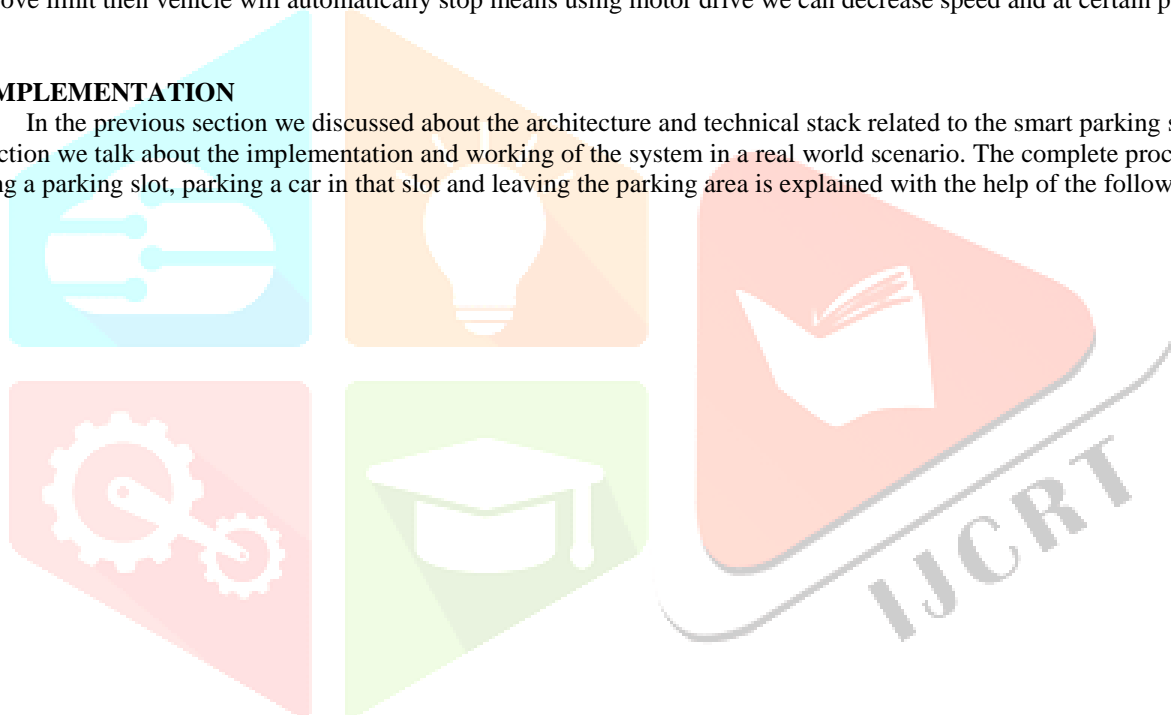
□ RFID tag: The mobile RFID tag acts like an interface for the end users to interact with the system. The purpose of this RFID tag is to provide the service of door open if it detect the RFID tag then it will open the door of car.

□ GSM: The GSM is used to provide the service of message. When the sensor will detect alcohol or smoke the sensor sends the information to the microcontroller then it provide that information to the GSM. Using this GSM we can send this update to the car owner or police by sending the message.

On closely looking at the figure one gets to see the RFID allow the user enter into the car sensor will sense the alcohol if it is above limit then vehicle will automatically stop means using motor drive we can decrease speed and at certain point it will stop.

#### IV. IMPLEMENTATION

In the previous section we discussed about the architecture and technical stack related to the smart parking system. In this section we talk about the implementation and working of the system in a real world scenario. The complete process of booking a parking slot, parking a car in that slot and leaving the parking area is explained with the help of the following flow chart.



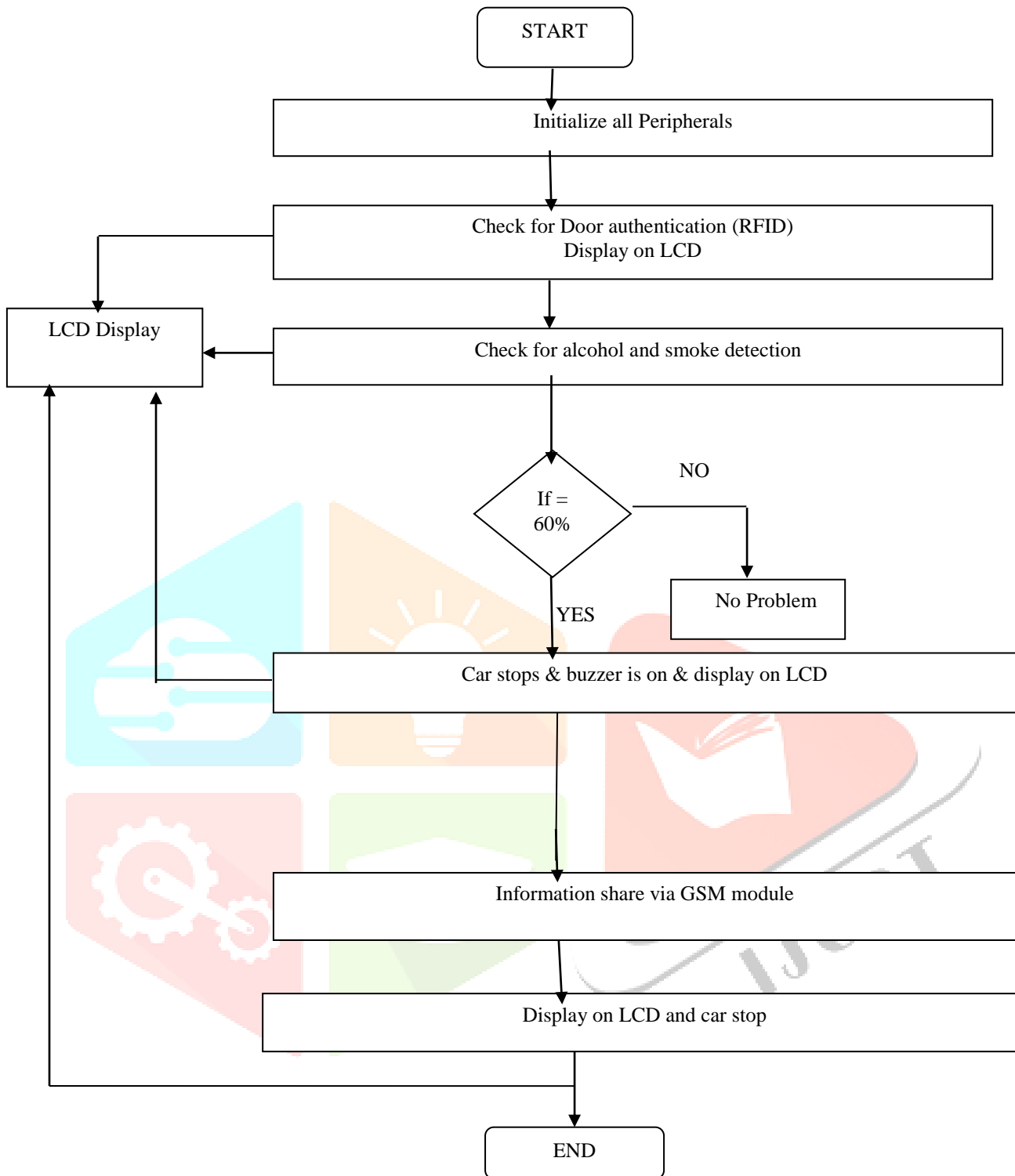


Figure 3: Flowchart of the system

We conducted an experiment in order to depict the working of our system at every stage from checking the availability of Alcohol or smoke in a car . Below are the steps that a show the car working after initializing the system.

- **Step 1:** Initialize all the controller using Microcontroller .
- **Step 2:** Check for the door open using RFID.
- **Step 3:** Check the alcohol and smoke percentage using respective sensor.
- **Step 4:** If it is below 60% then no problem but if it is above 60% then it go to next step.
- **Step 5:** If it is above 60% then car stop and buzzer will be start.
- **Step 6:** Using GSM all the information is send to the vehicle owner.
- **Step 7:** All the information is display on LCD and car stop.

## V. CONCLUSION

The progress in science & technology is a continuous process. New things and new technology are being invented. As the technology grows day by day, we can imagine about the future which we may occupy every place.

An effort has been made to stop vehicle theft using advanced components such as GPS and GSM network with the help of the growing technology.

The purpose of the project is to get instantaneous vehicles information over wireless using GSM is successfully done. This project is very helpful for vehicle owners.

## VI. FUTURE SCOPE

- Automatic emergency braking
- Avoid car crash using new age sensor technology
- Pedestrian detection night vision
- Vehicle to vehicle communication

## VII. REFERENCES

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