

Smart Two-Wheeler

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Abstract: “In this growing population, the demand of motor vehicles is increasing rapidly. Hence, the number of deaths and injuries are also in tip. As travelling and driving are an integral part of life the accidents can be avoided by a few safety implementations. This study mainly focuses on developing a safety measures related to two-wheeler motor vehicles. Mainly the model consists of two modules the helmet and the engine module. The helmet module has inbuilt alcohol sensor, relay switch. These sensors communicate wirelessly with the two-wheeler's module through radio frequency transmitter. GPS and GSM system are kept closer to the engine. The engine module receives the information from helmet module through radio frequency receiver. The spark plug is shorted to ground with the help of relay, which is connected to the controller. The relay senses and releases the spark plug from ground unless the signal comes from the controller. The helmet is designed in such a way that it doesn't allow the engine to start unless the rider wears a helmet and also checks whether the rider is drunk or not. Theft has also increased in the developing countries in the recent years. Being light and easy to hide, a stolen two-wheeler is often difficult to search. It has therefore, become a pressing need to develop a low cost, easy to use solution to track them using GPS. As people are careless about their vehicle maintenance, they ought to be reminded about the servicing dates for the good health of vehicle also deals with the monitoring of vehicle's tire pressure on the daily basis. Here, we are using finger-print sensor for the owner to turn on the engine of the vehicle and for other person the physical keypad box is used where the input OTP has to be provided. If at all accident occurs, impact sensor senses the impact force and if found above the limitation then it sends SMS using GSM module to the nearby hospital and the close ones of the respected rider. And it also sends the location, where the accident took place using GPS.”

Keywords: alcohol sensor, relay switch, fingerprint sensor, 4*4 keypad, GPS, GSM

I. INTRODUCTION

Road accidents are getting increased day by day in our country due to carelessness of people on the road. Especially two-wheeler accidents are more common in our country. This happens because most of the people don't wear helmet. Even though our government keep on try to spread awareness through various advertisements in theatre, newspaper and in public places but our people still doesn't care and are not following the rules. In order to prevent the accidents as well as theft, a smart two-wheeler have to be developed which aims at the security and safety of the two-wheeler riders against road accidents. Two-wheeler theft has increased in the developing countries in the recent years. Being light and easy to hide, a stolen two-wheelers are often difficult to search. Therefore, presently it become a pressing need to develop a low cost, easy to use solution to track those using GPS. We have a lot of drink and drive cases and many accidents caused by them, to avoid such situations is mandatory now. As people are careless about their vehicle maintenance, they ought to be reminded about the servicing dates. Considering the above constraints, we have come up with smart two-wheeler which helps us overcome the stated problems.

II. METHODOLOGY

The block diagram is intelligible enough to understand that the PIC microcontroller drives all the sensors in the system.

- The sensors that are connected to the PIC microcontroller are the pressure sensor, alcohol sensor, fingerprint sensor, tire pressure sensor and the impact sensor.
- The GSM module along with the GPS module is also connected to the PIC microcontroller.
- The 16*2 LCD display is also driven by the PIC microcontroller.
- The PIC controller controls the ignition of the engine.

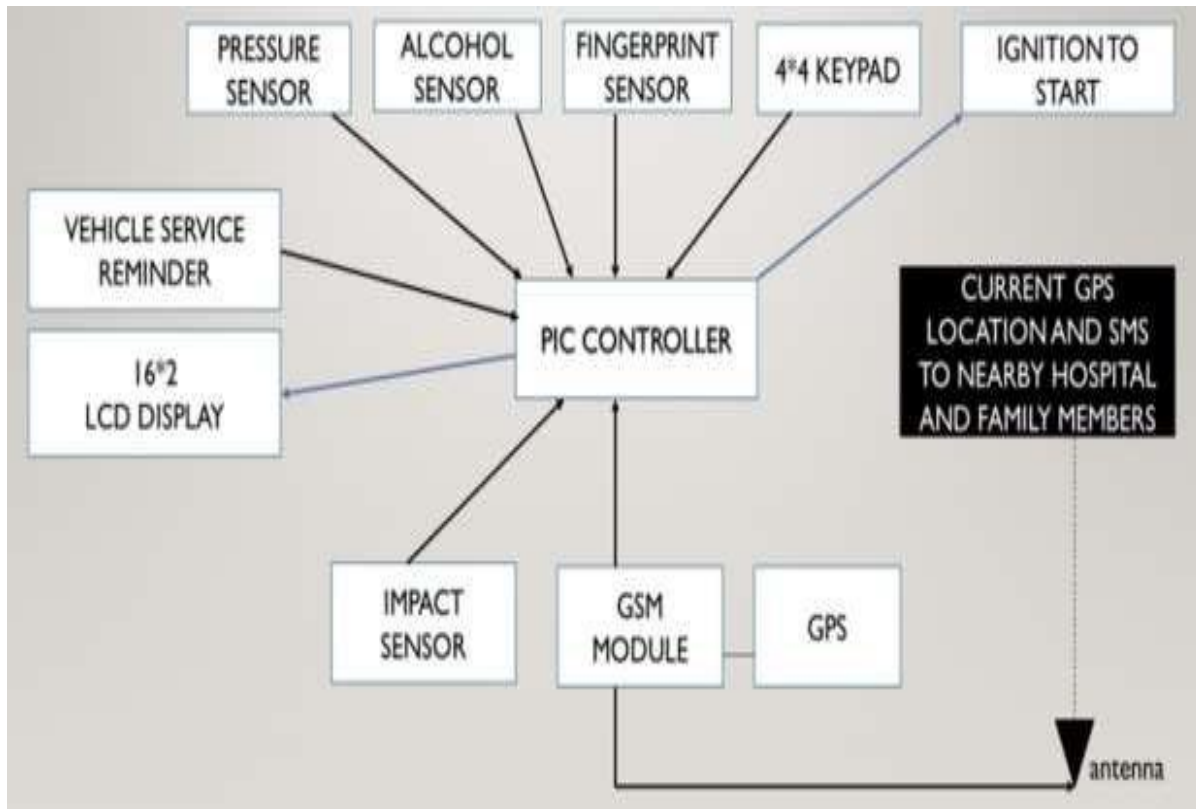


Fig 1: Block Diagram

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The different types of block diagram are as follows:

- PIC18F46K22 Microcontroller.
- Relay switch.
- Alcohol Sensor.
- Figure Print Sensor.
- Keypad 4*4.
- LCD 2*16.
- GSM Module.

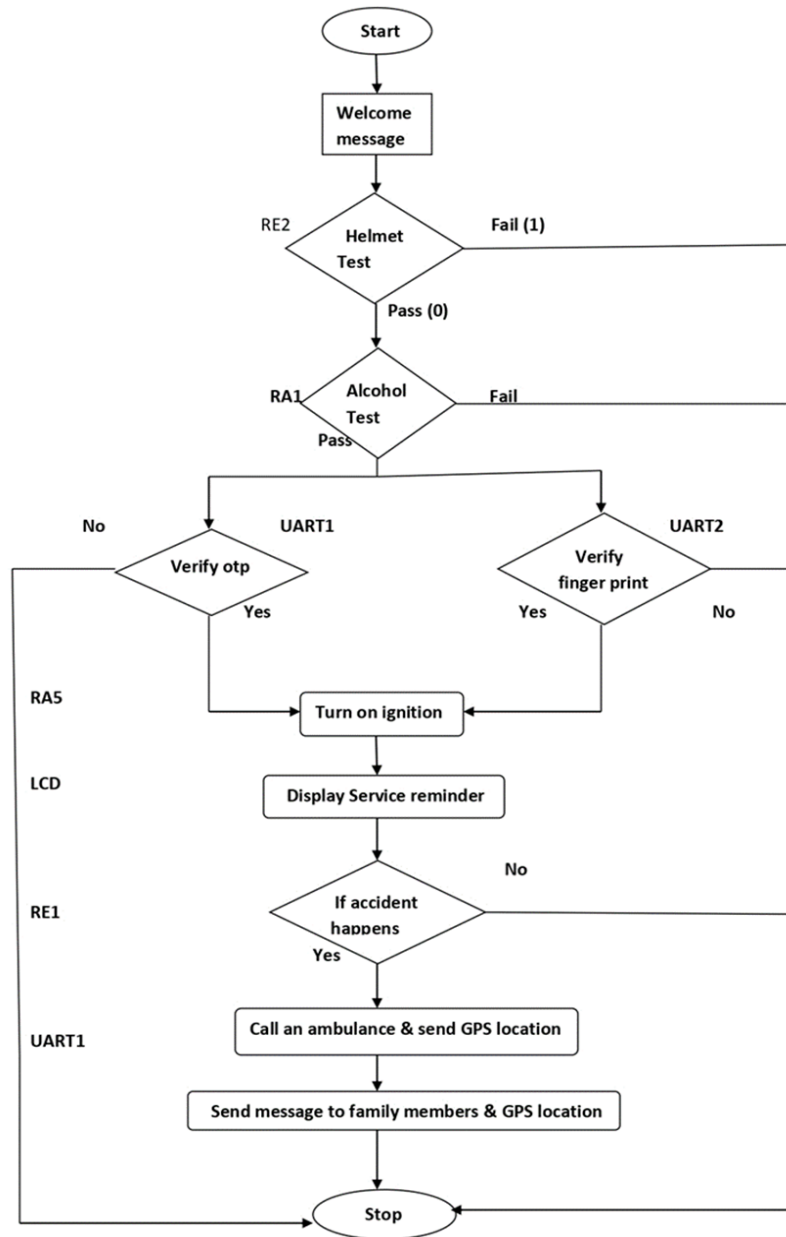


Fig 2.Flow chart

The fingerprint scanner along with 4*4 keypad to enter the OTP is placed beside speedometer. Alcohol sensor is placed inside the helmet facing towards the mouth & pressure sensor place towards the cheeks. Impact sensors are placed underneath the chassis on both sides left and right. When an accident occurs the relay switch detects the signal and it is sent to the GSM module to send a text message to the nearby hospital and the closed ones of the rider. A text message is sent to the rider when it is time for the vehicle to be serviced either based on the time limit or the distance travelled.

III.ADVANTAGES

1. Provides safety and secure vehicle riding by using the alcohol sensor and accident detection system respectively.
2. Authenticates the access to the vehicle using the fingerprint sensor or the keypad.
3. Tracks the position of the vehicle using the GPS system.
4. Sends the message on as to where the accident has occurred to the nearby hospital and the rider's family and also for receiving OTP, we are using the GSM module.

IV.RESULTS



Fig (a): Helmet Module

9:54 PM

P your OTP to proceed for IGN ON is 4213

your service is due on 10/08/2021

P Accident detected at Latitude 12.8362698 and Longitude 77.6499974

15 min

P your service is due on 10/08/2021

P your OTP to proceed for IGN ON is 4213

your service is due on 10/08/2021

P your OTP to proceed for IGN ON is 4213

your service is due on 10/08/2021

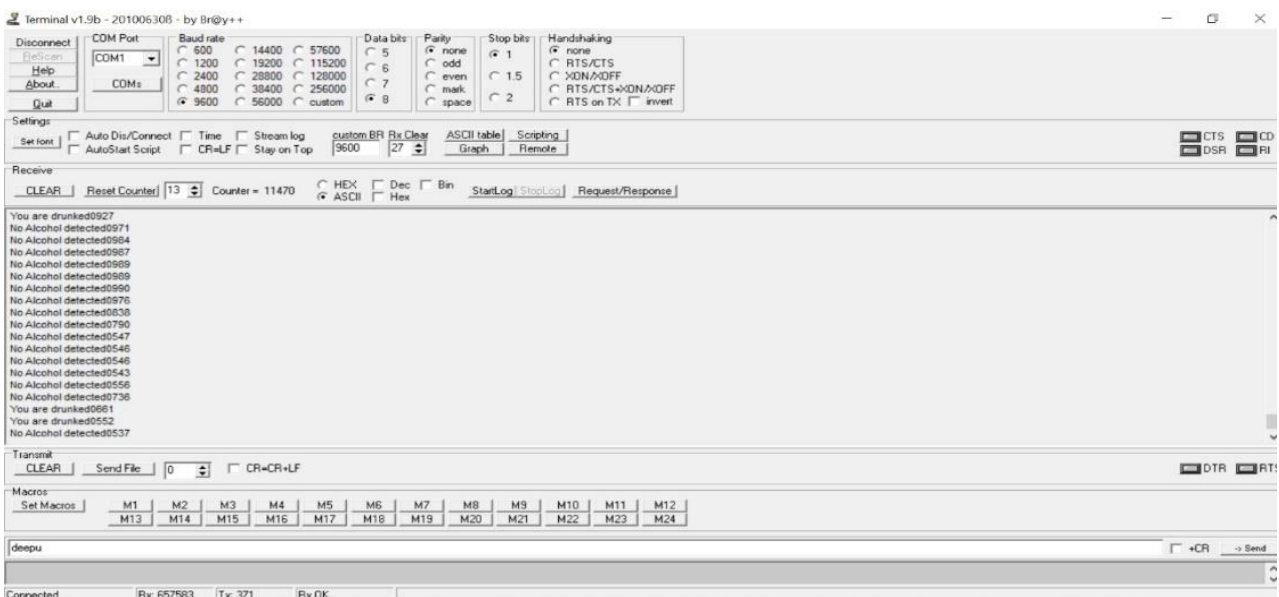
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Accident detected at Latitude 12.8362698 and Longitude 77.6499974

P Accident detected at Latitude 12.8362698 and Longitude 77.6499974

Now

Fig (b): OTP generation/SOS detection



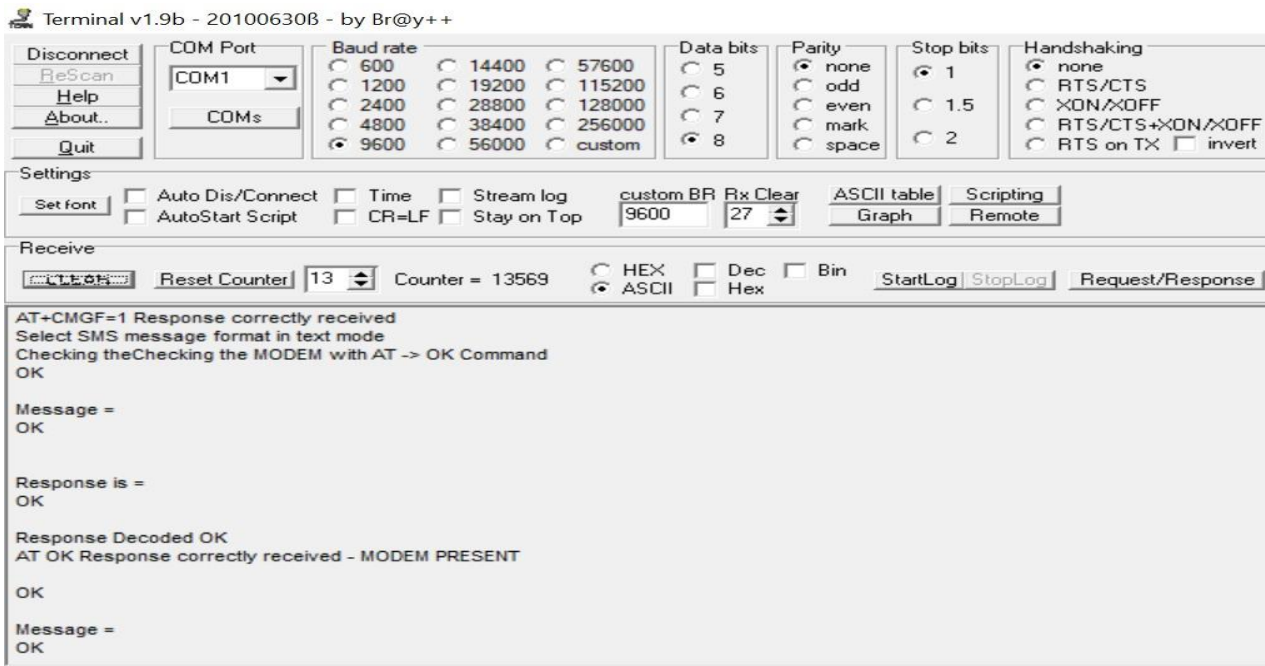


Fig (c): Alcohol sensor and GSM module output

V.CONCLUSION

This project is designed using structured modelling and is able to provide the desired results. It can be successfully implemented as a Real Time system with certain modifications. Science is discovering or creating major breakthrough in various fields, and hence technology keeps changing from time to time. Going further, most of the units can be fabricated on a single along with microcontroller thus making the system compact thereby making the existing system more effective. To make the system applicable for real time purposes components with greater range needs to be implemented

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