



# SMART HEADGEAR

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**Abstract:** As the bikers in our country are increasing, the road mishaps are also increasing day by day, due to which many casualties, most of them are caused due to most common negligence of not wearing the helmets, and also many deaths occur due to lack of prompt medical attention needed by the injured person. This motivates me to think about making a system which ensures the safety of biker, by making it necessary to wear helmet, as per government guidelines, also to get proper and prompt medical attention, after meeting with an accident.

**IndexTerms - Raspberry pi, ESP8266 Node Mcu, Voice Processing, MQTT**

## I. INTRODUCTION

In recent times helmets have been made compulsory in Kerala State. Traffic accidents in India have been increasing every year. As per section 129 of Motor Vehicle, Act, 1988, every single person riding a two wheeler is required to wear protective headgear following the standards of BIS (Bureau of Indian Standards). Also drunken driving under the influence (DUI) is a criminal offence according to the motor vehicle act 1939, which states that the bike rider will get punishment. Currently bike riders are easily escaping from the law. Road accidents are on the rise day by day and in countries like India where bikes are more prevalent many people die due to carelessness in wearing helmets. In present day scenario we encounter many cases of death due to two-wheeler road accidents. Despite of the fact that helmets are available everywhere, people do not wear it. In the event of road accidents, the WhatsApp message is sent to the emergency contact through GSM and provide accurate location of through GPS. It also provides audio processing to the riders needs (nearest fuel station, restaurant, ...). These are the main issues which motivates us for developing this project.

The main objective of this helmet is to provide safety for the rider. This can be implemented using advanced features like alcohol detection, accident identification, location tracking, use as a hands free device, fall detection, voice processing and finger print authentication. This makes it not only a smart helmet but also a kind of smart bike. It is compulsory to wear the helmet also alcohol detection and finger print. An ESP8266 Node MCU Module can be used as wireless link for communication between transmitter and receiver. If R.pi can help audio processing in the help of google assistant. In case of an accident it will send a WhatsApp message through GSM along with location with the help of GPS module. The distinctive utility of project is fall detection; if the rider falls down from the bike it sends WhatsApp message. The objectives of this project is to design a circuit that can improve the safety of motorcyclists, to develop a smart and safety helmet for complete rider.

## II. CONSTRUCTION

The smart helmet which is made is fitted with different sensors responsible for detection. There are two main units in this project. Each unit uses a microprocessor (Raspberry pi). Signal transmission between the helmet side and bike side (vehicle side) is done using a ESP8266 Node Mcu.

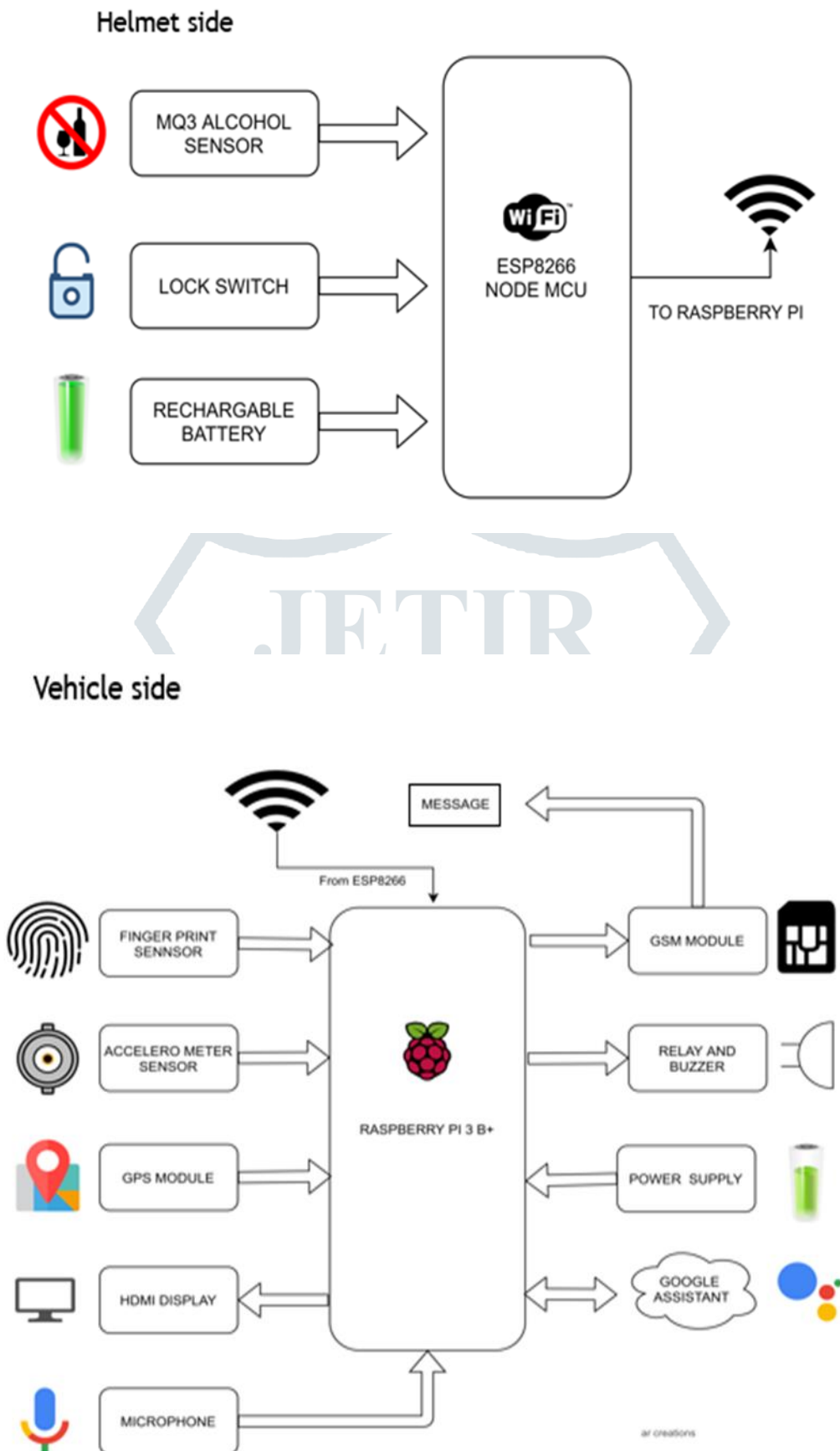


Fig 1. Block Diagram

III. CIRCUIT DIAGRAM

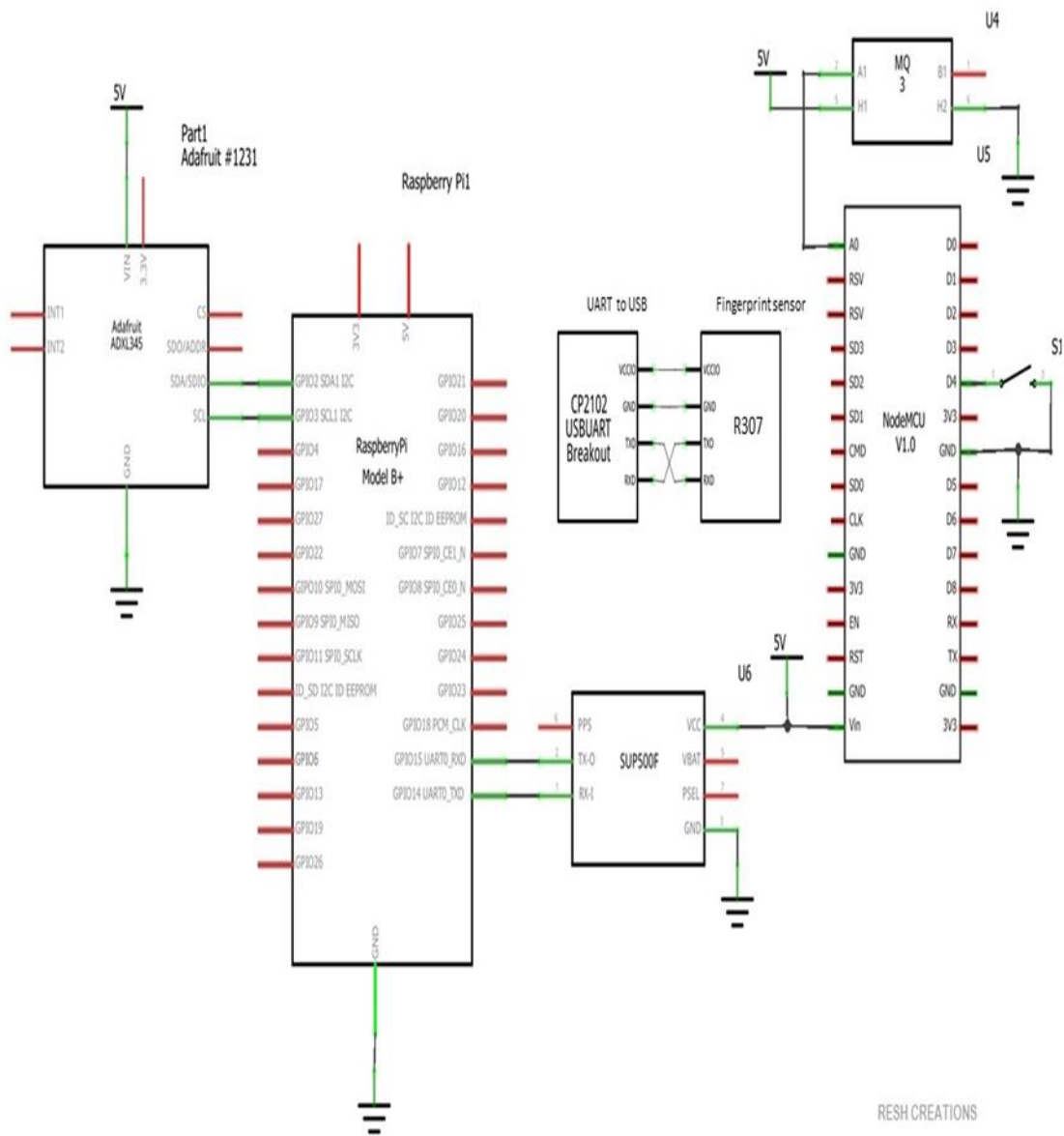


Fig 2. Circuit Diagram

IV. WORKING

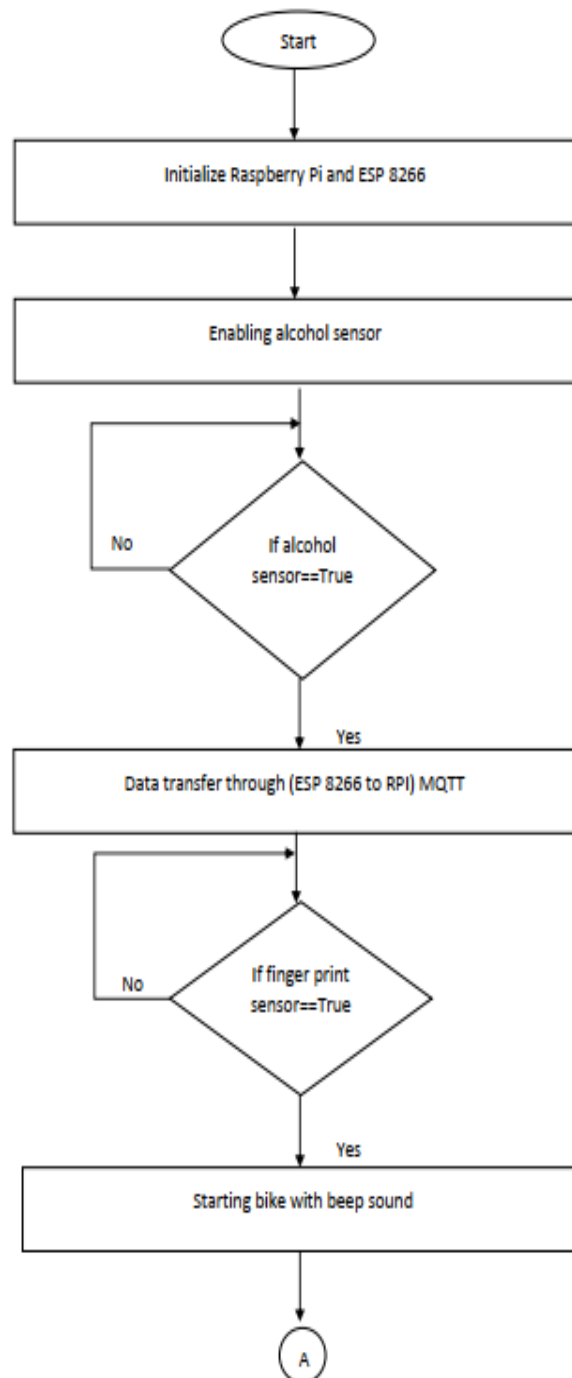
The proposed model of this project is an intelligent two wheeler ignition system with an additional intelligent helmet for the safety of the rider. The system ensures the safety of both the vehicle and the rider at the same time. Firstly the system requires to authenticate the rider from the preloaded fingerprints from the database of the microcontrollers which makes the helmet mandatory for the rider to wear as per the government guidelines. A module fixed on the helmet will be synchronized with the module fixed on the vehicle's side. The functions of the system are as follows:

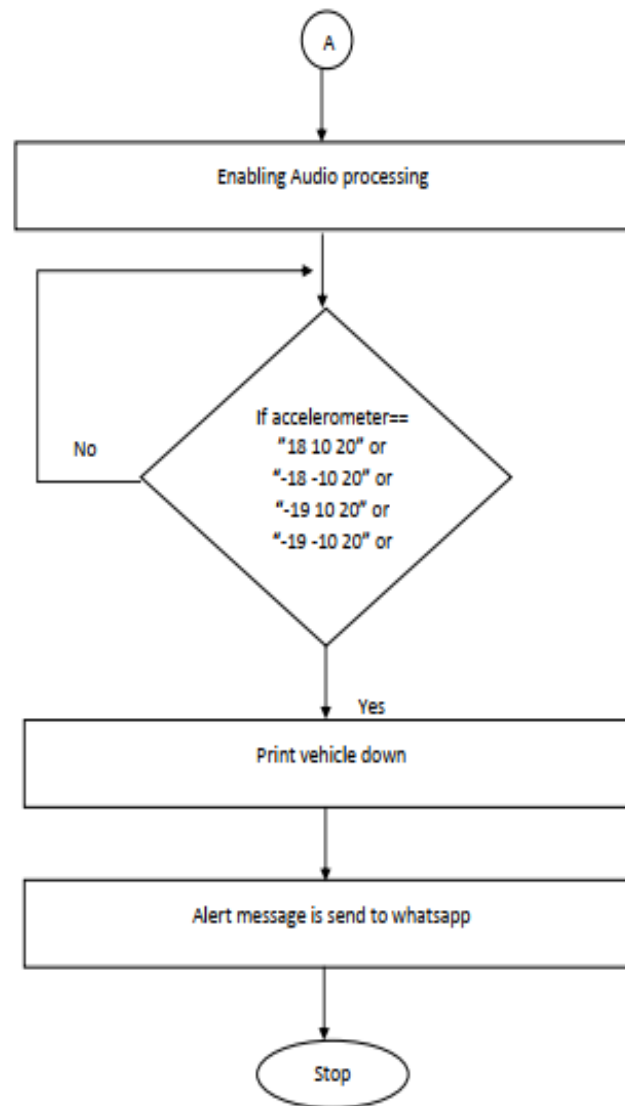
The first step is to identify whether the rider is wearing helmet or not. Second step is alcohol detection observed by breath analyser which detects the presence of alcohol in riders breath (using MQ-3 sensor).Third step is finger print sensor which will be using for authentication and security purpose of the riders. Fourth step,the bike starting for beep sound(using buzzer).Fifth step is audio processing for riders needs(using rpi voice processing unit).Sixth step is identification of accident(using accelerometer).In the final step if rider gets into an accident then an alert WhatsApp message with GPS location is send to nearest police station/relatives/hospital.

- To start the vehicle at the initial the rider has to firstly checking by MQ3 Alcohol sensor checking the alcohol content and lock switch wear or not.Then the MQTT helps to ESP8266 to rpi communication.

- The second condition will be checking for finger print authentication to rpi. These all conditions checking with regularly then all the conditions are satisfied then bike with start by beep sound.
- Then third condition will be audio processing (near petrol pump,near reasturant,hotels ...)will have it.
- The fourth condition must be checking for accelerometer .if statement must be using for this condition .then the bike will be accident the statement will progress then the alert message send by WhatsApp.

## V. SYSTEM FLOWCHART





## VI. CONCLUSION

Nowadays, most cases of accidents are reported with motor bikes. The severities of those accidents increased because of the absence of helmet or by the usage of alcoholic drinks. In our project we have a tendency to develop an electronic intelligent helmet system that efficiently checks whether the driver is wearing helmet and also drunken diving. By implementing this system a safe two wheeler journey is possible which would decrease the head injuries throughout accidents caused from the absence of helmet and also it will reduce the accident rate due to drunken driving. A GSM modem is used in this system that will send a WhatsApp message to the predefined numbers that are programmed using microcontroller in case of any accident.

## VII. FUTURE SCOPE

Alcohol detection & vehicle controlling through text SMS will inform the relatives or owners of the vehicle about the alcohol consumpt. Once alcohol detection is done, the system will find out the location of the vehicle. We can install a small camera for recording the drivers activity. We have used solar panel for helmet power supply by using same power supply, mobile charging can be done.

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