

# IoT Based Bike Analyzer: Delivery Boys Safety Control and Mechanism

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## ABSTRACT

The increase in population and the increase in number of vehicles has led to the increase in the number of accidents. Two wheelers accounts for 25% of total road crash death. Keeping in mind the safety of delivery boys who travel across the cities using two wheelers, this paper proposes an accident avoidance prototype using IoT. The prototype consists of two units namely helmet unit and vehicle unit which use sensors such as alcohol sensor, touch sensor and accelerometer sensor. The communication between the two units is established through RF signal transmission. The administrator is able to keep track of rider's status using GSM and an android application is provided as an alternative in case of helmet lost.

**Keywords:** Alcohol detection, GSM, Monitoring System, RF signals, Safety System, Sensors, Smart Helmet

## I. INTRODUCTION

Two wheelers are widely used than other form of vehicles due to its low cost and simplicity. Most of the time rider doesn't like to wear helmet which could result in fatal accidents. Drink and drive and rash riding are the major factors for such road accidents. Some statics shows that two wheelers cause 25% of the accidents and in that 60% of the two wheeler accidents are caused due to rash riding, drunken driving and not wearing helmet. The primary concern of all riders is safety.

Taking into consideration the safety of delivery boys who works for online business travels across areas using two wheelers, where safety of bike rider counts. Hence to track the activities of such rider and to provide safe riding this project has been proposed.

## II. PROBLEM STATEMENT

### A. Existing System

A wireless telecommunication, and is connected to a smart phone. The prototype uses sensors to detect a crash or accidents and the communication hardware is used to automatically dial a predefined emergency contact. The other existing system is to control the speed in which the biker is going in. The helmet is fixed with all the components and sensors that read the status of the bike rider and accordingly instruct the rider to reduce or increase the speed based on the sensor value. Along with the speed limit sensors, the helmet also checks if the rider is drunk and driving. If the rider is drunk then the ignition of the bike is avoided and hence not letting the rider to ride the bike.

### B. Proposed System

The proposed system consists of two units, helmet and vehicle. Vehicle is controlled via signals from

helmet unit. The helmet unit has sensor module to monitor whether helmet is worn or not, alcohol detection, all connected to Radio Frequency (RF) transmitter.

The vehicle unit has RF receiver. Based on RF signal received the vehicle starts and stops automatically. And every status is uploaded to database via GSM. In case of helmet lost the vehicle is ignited via android application.

### III. LITERATURE SURVEY

In literature, survey we come across various methods used to improve *“Smart Helmet”*. The helmet consists of alcohol sensor and eye blink sensor and acts as accident prevention system [1]. The intelligent helmet consists of sensors that detects the occurrence of an accident and makes provisions to sound an alert through the use of GSM system [2]. The *“Smart Helmet”* automatically checks whether the person is wearing the helmet and has non- alcoholic breath while driving. The relay does not ON the vehicle unit if these two conditions are not satisfied [3]. The ALCHO-LOCK function is used to prevent drink and drive scenarios and accelerometer detects accidents [4]. There is a switch used to ensure the wearing of helmet on the head. The ON condition of the switch ensures the placing of the helmet in proper manner. An alcohol sensor is placed near to the mouth of the driver in the helmet to detect the presence of alcohol [5]. The accident detection system communicates the accelerometer values to the processor which continuously monitors for erratic variations [6]. Message transmitting sensors are equipped in the speedometer of bike and also in the bike’s helmet. The most important feature of the bike is that the bike’s engine gets start only when the person wears helmet [7]. The system uses advance features like alcohol detection, accident identification, and uses hands free device, solar powered, fall detection. This makes not only smart helmet but also feature of smart bike [10]. The vehicle location is obtained by making use of the global positioning system. The system

promises a reliable and quick delivery of information relating to the accident in real time and is appropriately named Konnect [12].

### IV. METHODOLOGY

In this project there are two units namely helmet and vehicle module, helmet will have control over the vehicle start and stop.

#### A. Helmet Unit

In Helmet the sensor module is built using sensors like alcohol sensor, accelerometer sensor, touch sensor and all the above sensors are connected to RF transmitter which is placed on helmet unit to detect weather a person worn helmet are not, once the person wear the helmet the signals gets transmitted.

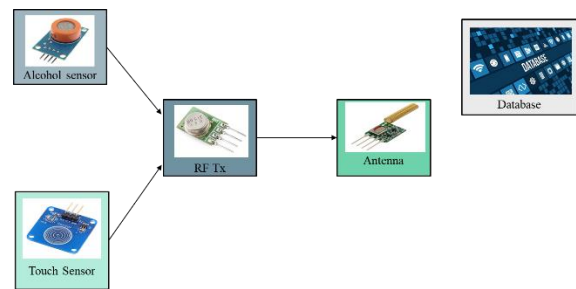
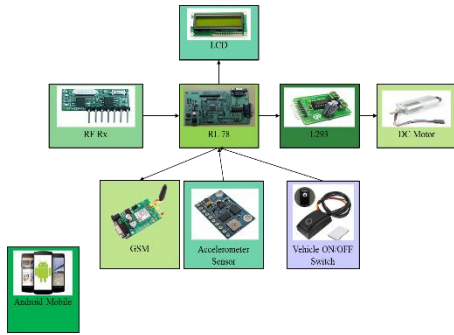


Figure 1. Block Diagram of Helmet Unit

#### B. Vehicle Unit

The unit in the bike allows the rider to start the vehicle once the module receives signal from helmet unit. The status of the helmet worn is uploaded to admin database via GSM. In case of alcohol consumption the vehicle remains off though helmet is worn and status is uploaded to database. The rash driving detection is done using accelerometer sensor and rash driving status is uploaded to database for further action. The android application is maintained by company authorities looking at database the rider status is tracked and required measures are taken.



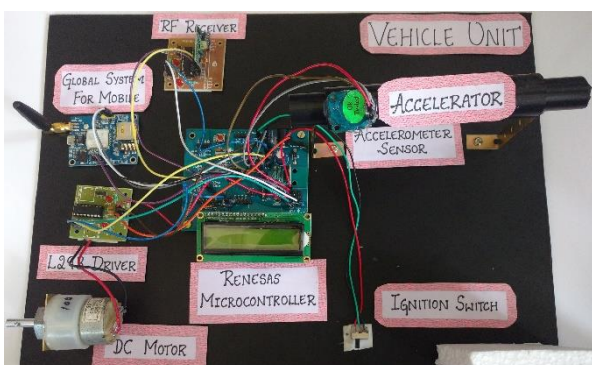
**Figure 2.** Block Diagram of Vehicle Unit

In case of helmet lost android app is provided to the delivery boy to ignite the vehicle through start button for 3 times. After 3 chances helmet lost is noticed to authority for further action.

### V. RESULTS



**Figure 1.** Helmet Unit Affixed With Alcohol Sensor, Touch Sensor and RF Transmitter



**Figure 2.** Vehicle unit affixed with accelerometer sensor, GSM module, DC motor, DC driver, RF receiver and Renesas microcontroller.



**Figure 3.** When Helmet Is Worn and No Alcohol Content Is Detected, the Vehicle Unit Starts



**Figure 4.** When rider exceeds the speed limit, the alert message “High Speed Continued” is displayed



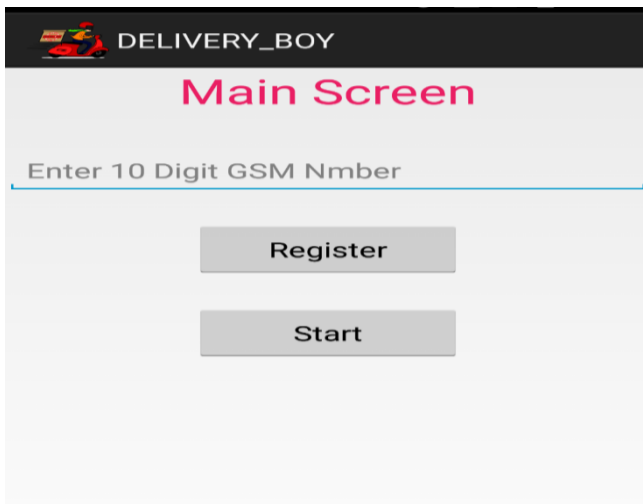
**Figure 5.** When rider is not wearing helmet, an alert message is displayed



**Figure 6.** When the Rider Has Consumed Alcohol, an Alert Message is displayed



**Figure 7.** When rider has not worn helmet or alcohol content is detected, the vehicle unit is deactivated.



**Figure 8.** Android Application for Delivery Boy to Start the Vehicle In Case Of Helmet Lost or Forgotten

### B. Advantages

- “**Smart Helmet**” can be used in real time safety system with less power consumption.
- It can be used to limit the speed of the vehicle.
- Protection against theft of bike.
- The whole circuit can be implemented into small unit.
- Safety system technology can further be enhanced in car.

## VI. ACKNOWLEDGEMENT



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## VII. CONCLUSION

A system for smart helmet has thus been developed which, through communication between a unit in the helmet and one on the vehicle. Smart helmet ensures the safety of the delivery boy, by making it necessary to wear helmet, and ensures that the rider hasn't consumed any alcohol. If any of these prime safety rules are violated, the system will prevent the biker from starting the vehicle unit and an android application is provided to the delivery boy to start the vehicle unit in case of helmet lost or forgotten. This system aims in providing a low cost safety system mainly focusing on the importance of human life.

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