

Smart Helmet

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Abstract- *In the 21st century, where bikes are getting less expensive step by step, where mishaps rates are high. As indicated by a review 4,64,910 street mishaps happen because of bikes every year whether the shortcoming is of the biker or the vehicle, consistently the biker meets a mishap. The different purposes behind the mishaps are drink and drive, rash driving, not having control over the speed. Be that as it may, the principal reason was the nonappearance of the helmet on the individual who is riding the bike which prompts quick demise or head injury. We face a daily reality such that the guidelines of the street are abused routinely. To solve this issue, we have planned a device which we have given a name called 'Smart Helmet'. There are two modules which we have proposed: one is the head protector and the other one is the bike circuit. We proposed a Piezo electric buzzer to check whether the speed limit is not exceeded. Next is radio frequency which is in charge of the remote correspondence between the bike circuit and the head protector. There is likewise an ALCO-LOCK feature where we can identify whether the biker is defying the guidelines of 'drink and drive' or not. There is a GSM module wherein the case of a biker meeting a mishap, at that point a message is sent to a registered contact and also sends a message to Police and Ambulance. And we have also added a smart mode, where if a person is riding a bike and someone calls him a message will be sent to the caller that the person you are trying to call is currently riding the bike and furthermore there is a fog sensor which is utilized for the better vision for the biker.*

Indexed Terms- Accelerometer, Arduino, LDR, Microcontroller89S52, MQ-6, RF module.

I. INTRODUCTION

We decide to do this project for betterment towards society. In the current century, the accident rate due to two-wheelers is increasing which leads to the loss of many lives. According to a survey of India, we have noticed that 45% of accidents occur due to a two-wheeler crash. There can be so many reasons which lead to accidents such as not having proper guidance or proper knowledge of riding, there can be issues or

defects in the bike, drunk & drive, not having control over the speed and so on. Sometimes the accidents which take place, the rider who is riding the bike may or may not be responsible for the accident, but in the end, the rider has to suffer or both the drivers. Accidents are just a single issue; there can be many reasons such as not getting treatment on time can also be the reasons for the deaths.

According to the survey of India, per year 45% of accidents take place, this is around 50%, whereas half of the injured people die due to not getting the treatment on time. There can be many reasons for this scenario which can be ambulances not on time, not a single person available at the incident to inform about the incident to the medical emergencies and the rider's family. By observing this situation in our day to day life, we have thought of a solution to overcome this problem and we had come up with an idea of sending the information to the medical emergencies and family members of the rider as soon as the accident occurs and on time, at last, time matters a lot. On somehow, we can save the lives which are lost due to bike accidents. It is well known that younger generations prefer bikes over four-wheelers. Apart from all these a survey indicates that 70% of the riders avoid wearing helmets without any reason which is against the traffic law. The common issues like speeding and drunk & drive. The accidents occur due to lack of experience or not having focus and not following the traffic rules which leads to accidents. The technology which we have come up with makes sure that the rider follows the traffic rule properly where the accident rates may get reduced. The idea of developing this technology comes from social responsibility towards our society. Despite all these, the main reasons were the absence of the helmet on the rider which leads to the rider which leads to immediate death due to brain damage. So our main goal is that the rider should wear the helmet while riding the bike and also providing solutions to other issues for accidents. It is our responsibility towards the society that we have come up with an idea of the "Smart Helmet" project. So the

idea of this project is taken from “Implementation and Analysis of Smart Helmet” & “Smart Helmet using GSM &GPS technology for accident detection and reporting system”

II. LITERATURE SURVEY

This chapter described a review of previous studies that are related to this case study. The literature review is conducted to understand the concept and also to get some ideas about the wireless system. Besides that, this research gives descriptions of related concepts, functionality, project procedure, components, equipment and also the cost of the project. According to [1], the author has introduced a technology that is a smart helmet because of growing accident rates. Riders get injured or dead because of not having a helmet. Many of them do not follow traffic rules. In India like country, the middle-class families prefer to buy motorbike over the car because of the budget and at low prices, various options are available to them in the market. In this technology, the author has used an encoder integrated circuit where it receives parallel data in address bits and control bits, but not focused on alcohol detection and many other features according to “Helmet using GSM and GPS technology for accident detection and reporting system”. In this proposal, we are designed to improve the safety of the bikers. The project uses the concept of RF transmitter and RF receiver circuit and also ARMT, GSM and GPS modules. There is a buzzer for indication. When the accident takes place it will note the information and will send it to the ambulance, police station and to the registered mobile number with the accident location. In this project, we are using a display device to display the messages that if the rider is breaking the rules. As the cost of helmets are high as they designed for only one purpose.

III. PROPOSED SYSTEM

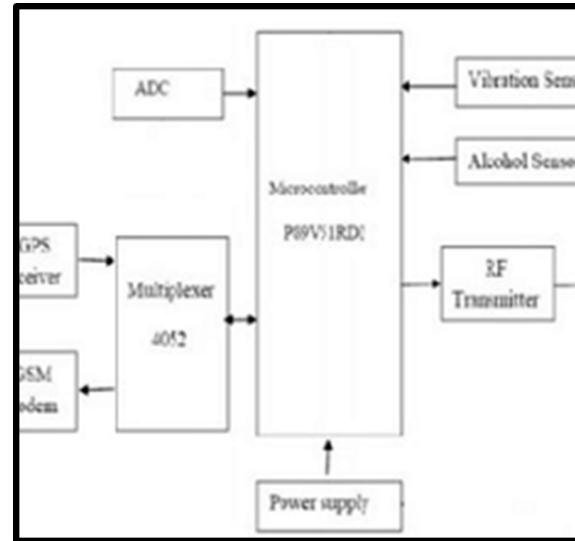


Fig1. Helmet Unit Architecture

In this technology, the rider cannot start his bike if he is not wearing the helmet. This smart helmet has a wireless switching on a bike that replaces the cable connections. The bike will not get started without the helmet and key. We have divided this project into two units which are helmet and bike.

- **HELMET UNIT:**

According to [1], it consists of an alcohol sensor, helmet sensing switch, encoder, RF transmitter, and MCU. The helmet has a switch and the alcohol sensor fitted in it. The comparator receives an analog output from the alcohol sensor which is known as ADC. The RF transmitter transmits the encoded binary signals which are obtained from the output of the lock sensor and comparator.

A smart helmet concept makes the motorcycle driving safer as earlier. GPS and GSM technologies are core technologies. The concept of this project is very simple; we have placed vibration sensors in different sections of the helmet. When the accident occurs and the helmet hits the ground, the vibration sensors will sense the vibrations of the helmet and if will pass the signals to the microcontroller and by using the GPS module the controller will extract the GPS data. The data which is obtained below the minimum stress limit than by using the GSM module will automatically

send an alert message to the registered mobile number and ambulance or family members.

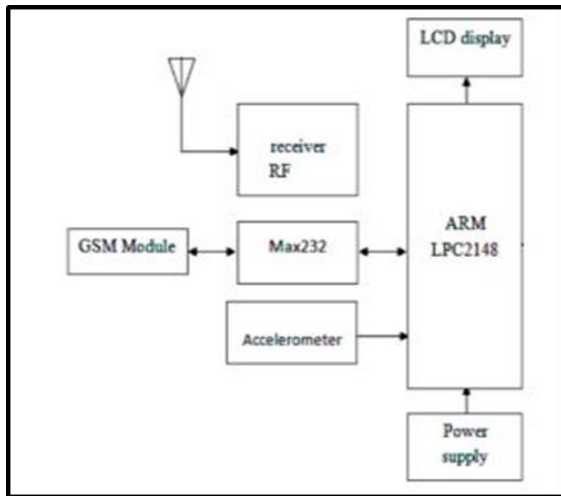


Fig2. Bike Unit Architecture

• BIKE UNIT:

According to [1], these units will first check whether the person is wearing a helmet or not, after this, it will also check the non-alcoholic breathe of that particular person while riding. This is ensured by the transmitter at the helmet and receiver on the bike. To check whether the helmet is on the head there are flex sensors. First of all the data is encoded by RF encoder and then it is transmitted through RF transmitter. There is a receiver on the bike unit which collects the data and this data is decoded by the RF decoder MCU is used to control the engine through a function called relay and a relay interfacing circuit.



Fig3. Representation of a system

IV. PROJECT ANALYSIS

The simplest representation of the user's interaction with the system is a use case diagram. It can describe

different types of users in a system and different ways to interact with the system.

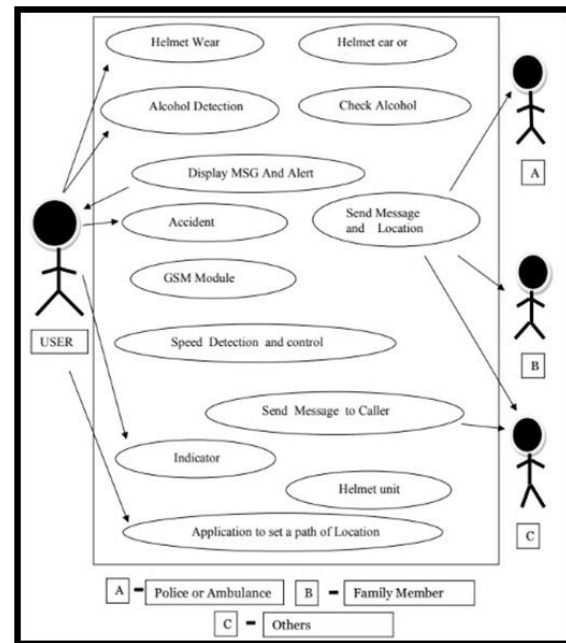


Fig. Use case Diagram

• Use Case Analysis:-

1. Actor: In use case diagram an actor is an entity that interacts with the system to complete the task by performing use cases. Different actors perform different roles in the use case diagram as the customer community that will use the product. The actors which are used in this case are a user, police, family, and others.
2. Description: This use case shows the interaction between the User, Police, family and others and how they are co-dependent on each other. Once the user is wear the helmet and it checks the all the conditions given in this project which provide safety to the user while driving.

CONCLUSION

We have used GPS and GSM modules to give notification of an accident and area to the registered phone numbers so that the medical emergencies can reach to the rider as early as possible. To start the bike, the rider should be wearing the helmet and he should not have consumed alcohol while riding the bike, this

reduces the possibilities of accidents. Here we have added engine cut off feature to reduce the risk of the accidents because even if the rider take care accidents do occur. This project acts as a virtual policeman which keeps the rider in check and makes the road safe. Besides all these, we have also added a feature of a speed limit where we have used LED light which acts as an alarm to alert the rider if he exceeds the speed 100km/hr.

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