Smart Helmet

Yashwantha N[1*], Mr. Hemanth S[2]

[1]Computer Science and Engineering, RNS Institute of Technology, Channasandra, Bangalore, India

[2]Associate Professor, Computer Science and Engineering, RNS Institute of Technology, Bangalore.

Abstract- The prospect of building up this proposed model originates from social obligation towards the general public. Absence of prompt First Aid and Emergency therapeutic administrations during mishap are prime reason for death in greater part of instances of mishaps. The one of the primary explanations behind this might be late entry of emergency vehicle, no individual at spot of mishap to give data to the emergency vehicle. This idea of taking obligation of society brought about our proposed model "Microcontroller based shrewd head protector utilizing GSM and GPRS". The point of this proposed model structure is to advise the mindful people at the most punctual about the mishap with the goal that they can take expected activities to spare the life of the harmed individual. Our proposed framework comprises of Arduino as Microcontroller, GSM for calling reason, GPRS for following reason and primarily Sensors to identify the mishap. Our proposed framework identifies the mishap and sends instant message alongside a voice message inside a moment to the enrolled number.

Keywords—Arduino, Smart helmet, GSM, GPRS, Microcontroller, Accident.

I. INTRODUCTION

The present world is known for its broad and various mineral assets and huge number of mining and Construction ventures. Managers are considered in charge of all wounds continued under their watch, and ought to accordingly know about possibly hazardous circumstances. The improvement of a mechanical protective cap so as to guarantee more security mindfulness between workers. When working with boisterous and unsafe gear, monitoring one's environment can now and again be testing.

In the ventures representatives will in general evacuate a portion of their security gear in light of the fact that the apparatus is excessively overwhelming, warm or awkward to work with. In any case, workers for the most part don't expel their caps. By and by wellbeing caps just have the reason for ensuring the workers head against potential dangerous knocks. The wellbeing protective caps don't have any innovation added to it to tell workers when an individual has experienced a perilous occasion.

Thusly, the reason for existing is to alter a current security head protector to make the cap even more secure by including a remote sensor hub organize. The undertaking was reached out to structuring the framework little enough to fit into the wellbeing protective cap and keep going long enough while running on battery control. A further test was to adjust the head protector without changing its physical structure. The additional weight must be kept to a base. A head protector should be changed to improve representative's security by adding knowledge to the cap. On the off chance that an item falls on a representative notwithstanding when wearing his protective cap, he can end up oblivious or fixed.

The framework must decide if a worker has supported hazardous damage. Than risky gases should be identified and reported. In the zone of mining innovation, continuous screen and control of mine peril are increasingly perplexing. Mine wellbeing modules are arranged to impart to ground control or a focal station. A genuine basic issue in ventures is unsafe gases. Frameworks utilized in an industry can make exceptional vibrations and increment the dimension of risky gases, for example, CO, SO2, NO2 and particulate issue. The working conditions can be extremely uproarious and representatives don't observe each other always. Workers will in general remain in gatherings and will be close to 5 meters (m) from one another.

A notice framework should be joined that will caution workers inside a 5 m range that a representative is encountering a risky occasion. This framework needs to process and transmit the occasion inside 1 second (s). These frameworks measure the earth around the workers with gas sensors and are then used to actualize departures. These frameworks additionally alert the worker with the assistance of a vibrator band. The frameworks caution representatives, however when a worker is discouraged or harmed, an outside info is required from ground control.

The head protector can comprehend if the individual is wearing the cap, utilizing the weight sensors, fitted inside the cushioning froth. The protective cap can recognize a conceivable mishap, utilizing the installed accelerometer and weight sensor. On the off chance that the qualities recognized surpass a limit, it is accounted for as a mishap. Crisis contacts, indicated by the rider during application setup, are educated about the conceivable mishap, by means of a framework created email and instant message, containing the location and GPS facilitates where the mishap had been distinguished.

II. LITERATURE SURVEY

The mechanisms that can detect if one is wearing the helmet, detect accidents, and detect whether the person has over- consumed alcohol. For this purpose, we use onboard sensors – flex sensor, impact sensor, accelerometer (ADXL355) and breath- analyzer (MQ3). The accelerometer measures the change in tilt, in X Y and Z axes respectively, and sends the data to a server via an online application programming interface (API). The breath analyzer senses the amount of alcohol present in the breath of a person wearing the helmet and reports if it is beyond the legal limit. The server also uses the data gathered from the accelerometer and the pressure sensors, to train a support vector machine (SVM). Advantage of the proposed mechanism is accurate in detecting an accident and high alcohol consumption. Whereas the performance is low.[1]

The smart helmet developed is a smart and reliable piece of technology that is cheap to develop and operate and yet not compromise on safety. Additionally, it offers several advantages over the existing methods of accident detection and notification systems that rely heavily on the data collected from cellular devices of the drivers. Also, most of the systems that are available in the automobile market are designed for only four- wheeled vehicles. Thus, the Internet of Things based application- Konnect, proposed in this paper will prove to ensure greater safety for the motorists. Provides reliability and quick delivery of information relating to the accident in real time and is appropriately named Konnect and is not cost efficient[2]. Two wheelers significantly contribute to road accidents casualties being a major transportation mode in India. Proposed system aims to reduce fatalities, head and face injuries due to road accidents by enforcing helmet usage using RF communication. It also safeguards vehicle by replacing conventional key with keypad. Furthermore, extension of safeguarding mechanism involving multiple operational modes is also considered for implementation[3].

Pothole Tracking System it will be easy to track down the pothole on the road and can easily get rectified. By this system the Municipal can also keep an eye on the quality of work of the contractor & we can get world class roads in our city will be done. This paper investigates an application of mobile detecting and reporting the surface conditions of roads.

The describe a system to monitor this important civil infrastructure using an Android based smart phone. The pothole tracking system, uses the inherent mobility of the participating smart phone by the citizen, opportunistically gathering data from image clicking from an Android based smart phone which is GPRS enabled, and processing the data to assess road surface conditions. The mobile app is aimed at providing government with detailed statistics of areas with high numbers of potholes. No long procedures of complaints. It's easy for the citizens to complaint the potholes and doesn't need to go for long process of complaining. Corporations are having evidence to all the work done or doing. It's also easy for the admin and the contractor to the potholes.

III. ARCHITECTURE

The design setup technique is worried about structure up an essential fundamental framework for a system. It incorporates perceiving the genuine pieces of the system and trades between these sections. The starting setup strategy of perceiving these subsystems and working up a structure for subsystem control and correspondence is called development displaying plot and the yield of this framework methodology is a depiction of the item basic arranging. The proposed design for this framework is given beneath. It demonstrates the manner in which this framework is structured and brief working of the framework.
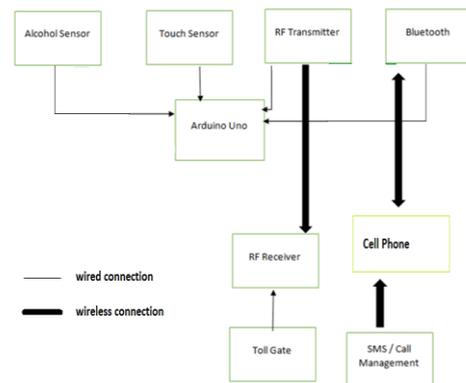

Figure 1 – Architecture diagram

A. Start Bike

Liquor Sensor is a finished liquor sensor module for Arduino or Seeeduino. It is worked with MQ303A semiconductor liquor sensor. This liquor sensor is appropriate for distinguishing liquor fixation on your breath, much the same as your regular breathalyzer. It has a high affectability and quick reaction time. Sensor gives a simple resistive yield dependent on liquor fixation. The drive circuit is extremely basic, all it needs is one resistor. On the off chance that liquor is distinguished, at that point the bicycle won't begin. The cap is fitted with three touch sensors. In the event that all the three touch sensors identifies skins, at that point it enables the bicycle to begin..

B. User and Road Rules

Administrator can include client and the client subtleties are put away in the server while including the client subtleties clients name contact number vehicle type vehicle

number and the ledger or E wallet number is connected with a client ID. Administrator additionally at the street data like as far as possible individually and each one of those subtleties are spared in the server.

C. Call Control

The protective cap is associated with Android telephone by means of Bluetooth when the client get any call while he is riding the application can move the data to the head protector by means of Bluetooth the Android application utilizes the versatile GPS and dependent on the GPS area 50 the street data or Road rules from the server and patient that the application share the data or send the data to the cap and on the off chance that the client is disregarding any guidelines, at that point give legitimate alarm as a discourse we have utilized One headphone so the client can hear the data.

D. Accident Detection

The helmet is fitted with contamination sensor and a crisis catch is a bicycle met a mishap or tumbled down their head protector identify that if inside 3 seconds the rider presses the catch fiddle is fitted with helmet it doesn't send any warning to the family or adjacent clinic or rescue vehicle in the event that mishap identified and the client doesn't react inside 10 seconds, at that point a crisis caution is sent to the closest medical clinic or the relatives alongside utilizations current GPS area.

E. E-Wallet

The head protector has a one of a kind ID and the ID is connected with the new wallet of the client to give an agreeable right when the rider attempting to cross any toll door moving toward the RF handset associated with the cap decipher the data and the RF handset associated at the toll entryway this is the data enter the toll door send the data to the server and the charges are deducted from the e-wallet are associated record of the rider.

IV. WORK FLOW

A. Data Flow Diagram

The DFD is direct graphical formalism that can be used to address a structure similarly as the data to the system, diverse getting ready did on this data and the yield data made by the structure. A DFD model uses an astoundingly foreordained number of crude pictures to address the limits performed by a system and the data stream among the limits. The rule inspiration driving why the DFD strategy is so celebrated is no doubt in light of the manner in which that DFD is an uncommonly essential formalism-It is anything but difficult to grasp and usage. Starting with the game plan of unusual state works that a system plays out, a DFD show continuously addresses diverse sub limits. All

things considered, any different leveled model is anything but difficult to get it. The human character is to such an extent that it can without quite a bit of a stretch see any dynamic model of a structure in light of the way that in a different leveled model, starting with an amazingly clear and one of a kind model of system, particular focal points of a structure are bit by bit introduced through the various requests. An information stream outline (DFD) is a graphical portrayal of the "stream" of data through an information system. DFDs can in like manner be used for the impression of data taking care of.
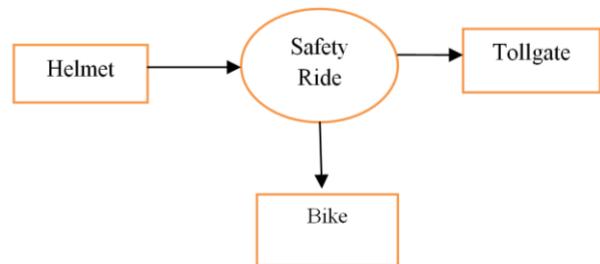
Level 1

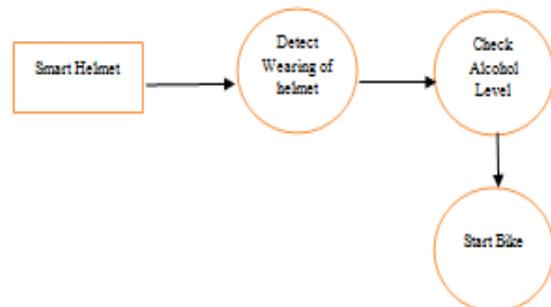Figure 2: Level 1 Data Flow Diagram.

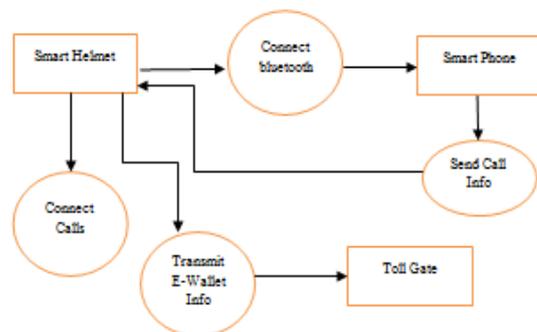Level 2

Figure 3: Level 2 Data Flow Diagram.

Level 3

Figure 4: Level 3 Data Flow Diagram

B. Sequence Diagram

An arrangement outline is a framework is a collaboration graph that shows how procedure works with one and other and in what request. It's a develop of a message

arrangement diagram. A succession graph shows object cooperations organized in time grouping. It portrays the items and classes associated with the situation and arrangement of messages trade between the articles expected to do the usefulness of the situation. Succession graph are at times called occasion outlines or occasion situations.
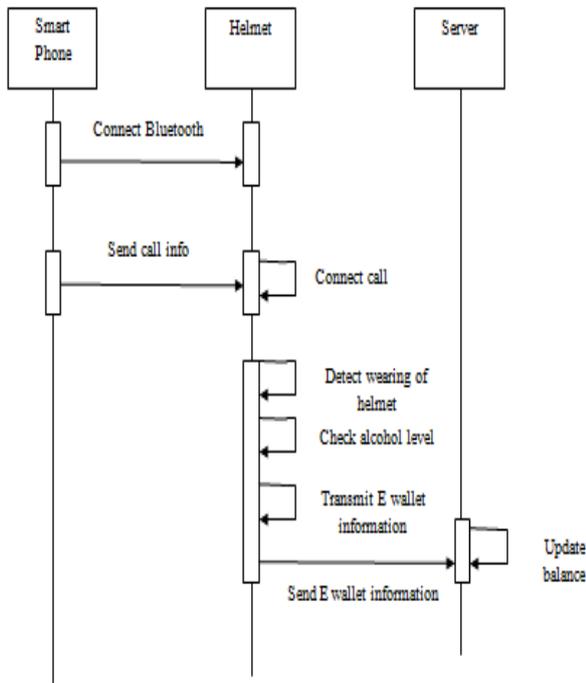

Figure 5: Sequence Diagram.

V. IMPLEMENTATION AND RESULTS

The implementation stage includes the real appearance of the thoughts, which are communicated in the investigation archive and created in the structure stage. Usage ought to be ideal mapping of the structure record in a reasonable programming language so as to accomplish the important last item. Regularly the item is demolished because of off base programming language picked for execution or inadmissible strategy for programming. It is better for the coding stage to be legitimately connected to the plan stage in the sense in the event that the structure is as far as item situated terms, at that point usage ought to be ideally completed in an article arranged manner.

Step 1 - A GPS, and microcontroller are present on the helmet. At the point when an abrupt change surpassing the edge an incentive in every one of the 3 bearings is watched all the while, the adjustment in resultant increasing speed is determined. Normal variety of resultant speeding up qualities is determined over differing windows of time and after that looked at with the increasing speed edge. On the off chance that the esteem is surpassed, at that point the processor distinguishes an accident.

Step 2–When the person wears an helmet the Bluetooth device present in the helmet, it ll automatically connects to the Bluetooth application present in the riders mobile. The rider has to give the emergency number to the mobile application initially.

Step 3 –The rider starts the bike then the alcohol sensor present in the helmet will sense if the rider has drunk or not. If the rider drunken then the system will automatically sends the message to the emergency contact that the person is drunk and he is riding the bike.

Step 4-Once the rider starts riding the bike his average speed is recorded. When the rider exceeds his bike speed then whichever call comes the mobile will not ring and sends the message like person is riding the bike.

Step 5 – If the person is travelling in any toll gate roads, when the toll gate comes the amount will automatically detected from the riders wallet according to the distance coverd.
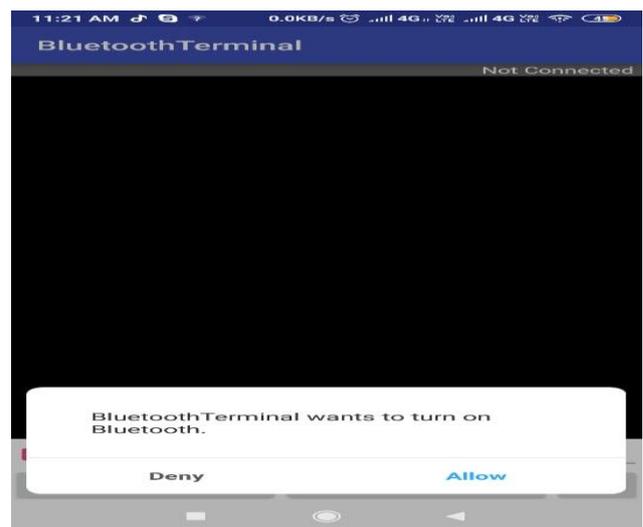
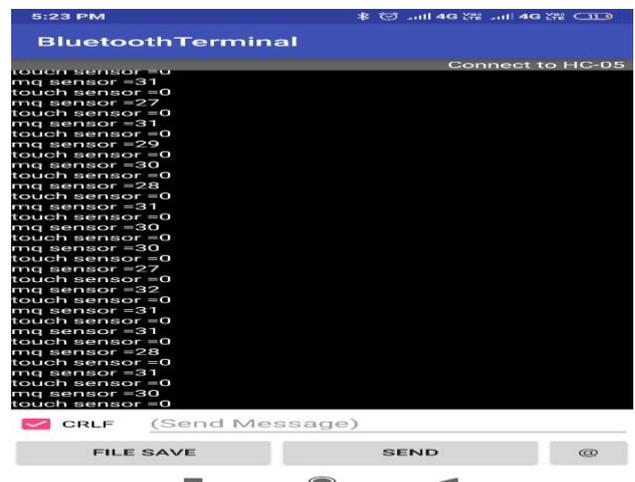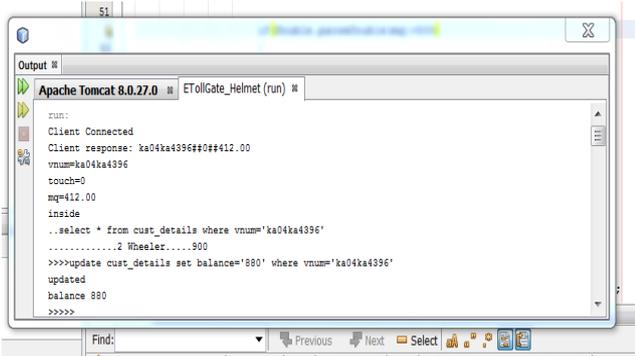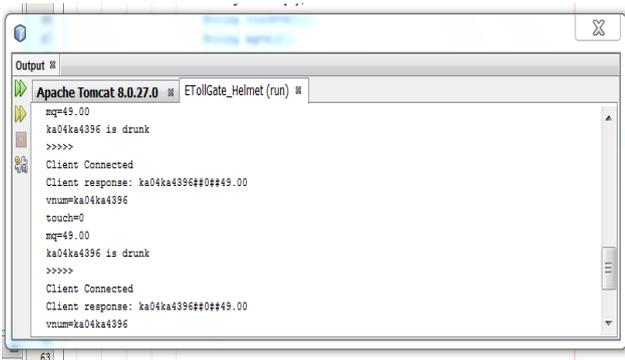Few snippets of results are as follows:

Figure 6: Snippet 1

Figure 7: Snippet 2

Figure 8: Snippet 3

Figure 9: snippet 4

VI. CONCLUSION

This project incorporate these highlights – High exactness, Cost productive, giving data about mishap inside moment, Facilities to call rescue vehicle naturally at the season of mishap with more noteworthy proficiency. This undertaking is successful for mishap happening in rustic territory where no any offices to help like police, group and rescue vehicle. "Without legitimate activity at appropriate time, peril anticipates us with a greater face." We should follow up on time when an individual is harmed. We have to see how valuable existences of individuals are and what significance medical aid conveys in sparing these valuable lives.

In future, we will improve the head protector and make much more brilliant by means of executing GPS contraption, which might be utilized to follow the zone of the fortuitous event and address the closest sanatorium to be had for the help. We likewise can utilize photograph handling with camera work for you to alarm the rider about the speed of the vehicle behind him. Also, the head protector should moreover tell the rider around the no stopping areas.

ACKNOWLEDGEMENT

REFERENCES

[1]   Sayan Tapadar ; Arnab Kumar Saha , "*Accident and Alcohol Detection in Bluetooth enabled Smart Helmets for Motorbikes*", 2018 IEEE

[2]   Sreenithy Chandran, Sneha Chandrasekar, Edna Elizabeth N, "*Konnect: An Internet of Things(IoT) based Smart Helmet for Accident Detection and Notification*", 2016 IEEE.

[3]   G. Sasikala,Kiran Padol, Aniket A. Katekar and Surender Dhanasekaran, "*Safeguarding of Motorcyclists Through Helmet Recognition*", 2015 IEEE.

[4]   Rajeshwari Madli, Santosh Hebbar, Praveenraj Pattar, G.V.Prasad, "*Automatic Detection and Notification of Potholes and Humps on Roads to Aid Drivers*", Global Journal of Pure and Applied Mathematics. ISSN 0973-1768(2015).

[5]   Durga K Prasad Gudavalli, Bh.Sudha Rani, C.Vidya sagar,"*Helmet Operated Smart E-Bike*", 2017 Ieee International Conference On Intelligent Techniques In Control, Optimization And Signal Processing.

[6]   Artis Mednis, Girts Strazdins, Reinholds Zviedris, Georgijs Kanonirs, Leo Selavo, "*Real Time Pothole Tracking System Using Android Smart Phone*", IEEE International Conference 2011.

[7]   Pavan Gorade, Digambar Karde, Poonam Khilare, Abhishek Sontakke, Prof.Ranjana M.Kedar, "*Real Time Pothole Detection using Android Smartphones with Accelerometers*", International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 3 Issue 5, May 2014