Development of Theft and Accidental Notification Systems for Two Wheelers

Rafi Riyaz, Rithin.K.Thedevos, Aareesh Joshy, B Madhu, K.Ramesh

Abstract: Each year, people within the world are progressively utilizing vehicles particularly motorbikes as their common means of transportation. Beside the increment of motorbike clients, motorbike robbery is additionally existing wild over a long time. In this consideration, a framework had been created for burglary anticipation of motorbike in a less demanding and quicker way. The client of this framework will be informed through an alarm, once the motorbike has been moved in a long remove or in case any wires they disengage to stolen. The bike theft is identified easily through Raspberry Pi Technology with the help of relay operations based on hardware and interlinked with software in mobile application. Whenever the bike is tried to steal or getting away unaware of user, the relay circuit gets activated in the bike and gives buzzer sound with bright lighting indicating as alert to the user in his/her mobile application. Another System idea was likely to get notified relative user for accident of a bike in any condition and to represent fuel levels in the two wheelers in terms of liters. Both the given system are dependable on mobile application like blynk and with Google Assistant enables the user to give the alert to the user is forging with accident. Gyroscope fixed in bike with sensors signaling Raspberry Pi which in turn user gets notification at any time. On other case if user is free from any injury he/she can reset the operation provided in the system. Finally users sometimes find difficulty ahead of analog representation of fuel in two wheeler to know the travel arrangements. So in this system ultrasonic technology implementing in the bike placed at the fuel tank lid senses the fuel level in bike and sends the resulting data to the user through same mobile application with the help of Raspberry Pi.

Key Words: Raspberry Pi, Accelerometer, Vibration sensor, Ultrasonic sensor, Global Positioning System (GPS), Global System for Mobile Communication(GSM), Internet access Google Assistant.

I. INTRODUCTION

In current generation, the people are mostly observed with handling the vehicles like two wheelers for easy use and finding efficient way to complete the work quickly as dependable. Looking around these phenomenon there are some disadvantages like securing the bikes with safety management and to upgrade for arranging journey plans .In show days the rate of mischances can be expanded quickly. Due to business the utilization of vehicles like cars, motorbikes can be expanded, since of this reason the mishaps can be happened due to over speed and careless driving.

Individuals are going beneath hazard since of their over speed, due to inaccessibility of progressed procedures, the rate of mischances can't be diminished.In this proposal the idea is discussed about various plans for renewing the two wheelers with high security system and additive features. From first impression of the idea the prototype is developed in comparison with existing methods. With the looks of existing system the idea was proposed on theft alert, accident and fuel notification is being developed with advance technology by using Raspberry Pi. For a given title development of accidental and theft notification systems for two wheelers the initial model is discussed about "Theft Prevention System". For Theft alertness there are technologies existing like Bluetooth alert and GPS notification to the user. Whenever the bike is getting theft the Bluetooth placed in bike with the help of Arduino based technology gives alert to the user through buzzer. As far as technology is developing the methods are implementing by thieves or third party user is reaching to small lengths of Arduino basis. Firstly, they discover the key slot wire and cut the wire short each other specifically at that point utilizing self-start button or kicker they can begin the motor bike ordinarily without key [3].

Figure 1: Bike Theft Methods in Two Wheelers by Thieves

For Theft Alert System a Relay Circuit placed nearby ignition battery linked in addition to it. Whenever thieves or any third party user tries to cut the wire of battery as described in Figure 1. To start the bike, relay circuit merged with ignition battery starts alert suddenly with buzzer sound which gives the notification in mobile to the user by using Raspberry Pi. In this method, the Google Assistant plays a vital role to find the bike and to alert the user over a voice command and with Blynk App. The next proposed system was to give the accident alert system to the client whenever the client met with an accident is saved immediately with following discussed operation.. The Accident notification to the clients is first used the technology of IOT with Arduino Automatic alert system for vehicle accident as shown in Figure 2. The main objective is to control the accidents by sending a message to the registered mobile using wireless communications techniques.

When an accident occurs at a city, the message is sent to the registered mobile through GSM module in less time. Arduino is the heart of the system which helps in transferring the message to different devices in the system. Here IOT will monitor the vehicles using magneto resistive sensors.
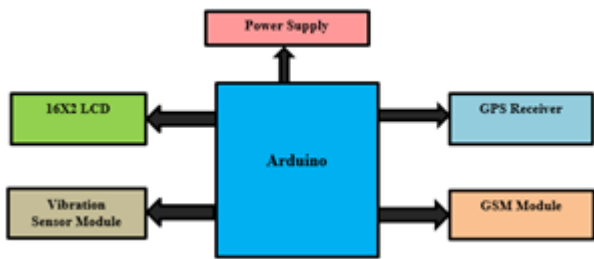

Figure 2: Block Diagram of Accident Detection and Alert System

For accident alert system, the gyroscope sensors is placed at safe position in two wheeler. The basic operation of gyroscope is performed according to the principle of angular placement. In general the sensor is placed at fixed angle, if any changes in angle is observed due to accident the gyroscopes alert user and also gives a high decibel buzzer for emergency help. In addition vibration is also placed if the bike seemed to be hit other vehicles. In the proposed system, fuel level will be displayed in terms of litres.

There are a few existing strategies which is utilized within the engine motorbike to showcase the Gas/Fuel. Those measurements are shown within the analog meters that are not accurate described below Figure 3. Today in this digitalize world, if the fuel indicator within the automobiles is additionally made advanced it'll offer assistance to know the precise sum of fuel accessible within the fuel tank in liters.

Figure 3: Existing Fuel Meters Existing Images

If the fuel tank capacity is 12 litres and when we filled 6 litres is shown within the fuel meter '1/2' .what the issue here if the fuel is consumed 1 litres from the 6 litres of fuel again its displayed as '1/2' . In this strategy Fuel indication ultrasonic sensors is placed in the fuel tank lid in relevant position without any harm The accuracy level is up to 95 – 98% because the error was around ± 0.02 liters. It displays the exact liters on plane roads and shows error value on slope surfaces respectively. This esteem in liters will be in numerical digits (ex: 1.2, 1.3, 1.4) and in levels too. .The same operation is also used with Google assistant for user friendly.

II. PROPOSED WORK

The proposed idea is being segmented as a prototype reliable to the user. In the model of "Theft Prevention System" , thieves or any third user steals the two wheeler easily apart from any requirement of tools uses a rod or strong steel where the side lock of the bike is broken simply

and taken away from the client results in safe less requirement of keys[3] .They simply uses the methodology of cutting the wire linking with Ignition Battery which in turn Engine of the bike starts without inserting keys of user[6].So the proposed model is developed focusing on Battery and Key slot connected system which places an additional relay circuit placed at hidden place of the bike. If thief tries to cut the wire the Relay will activate immediately and sounds with high decibel buzzer which notifies user with mobile application through Raspberry Pi regarding theft alert system.

Remarking on the next system named "Accident Alert System" the ideas are existing in the market which dumped lot of solutions but sometimes fails to operate at a time due to over damage of two wheeler. In our system the accelerometer with vibration sensor. If any client is met with an accident the accelerometer changes its fixed position to variable position which an gives change of signal to Raspberry Pi as a command that gives with same high decibel buzzer. In optional the reset switch is placed which can be activated by client if he/she is safe. In final proposal "Fuel Indication System" every vehicle has analog and digital meter but it fails to execute an appropriate liters. Our model made with ultrasonic sensors works in combining with Raspberry Pi and displays exact liters. Moreover, as a result the whole operation of each system is performed with a Single Raspberry Pi Module

III. THEFT PREVENTION SYSTEM

In this proposed system, the model is mainly generated targeting on the way by which two wheelers getting stolen. When the thief is taking the bike by breaking and brief circuiting the electrical wires going for start unit, a buzzer sound will be given by the alarm proposed within the bike as detailed in Figure 4. The proposed burglary caution framework shown in Figure 4 comprises of a transfer with Normally Open (NO) condition and arrangement association of buzzer and blazing lighting unit. When the cheat tries to cut the wire, the transfer will move into Normally Closed (NC) condition and subsequently it'll enact the buzzer (siren) sound showcased in circuit diagram Figure 5. The developed prototype model is shown in Figure 6.
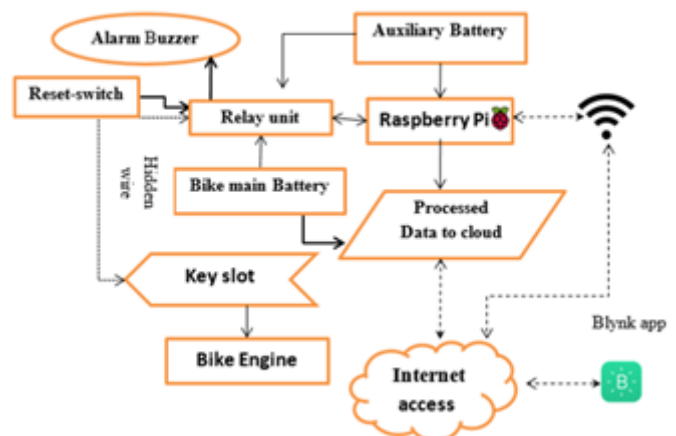

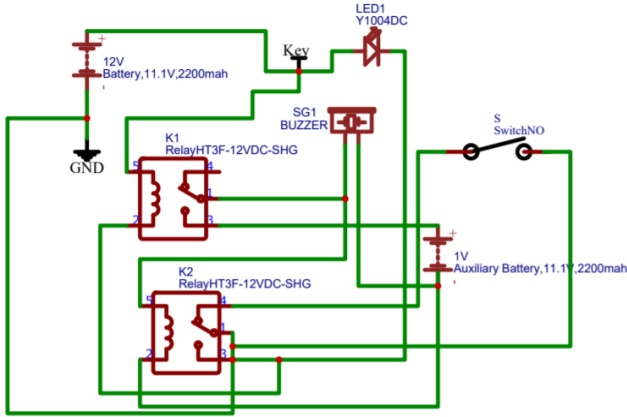**Fig.4 Block diagram representation of Theft prevention system**

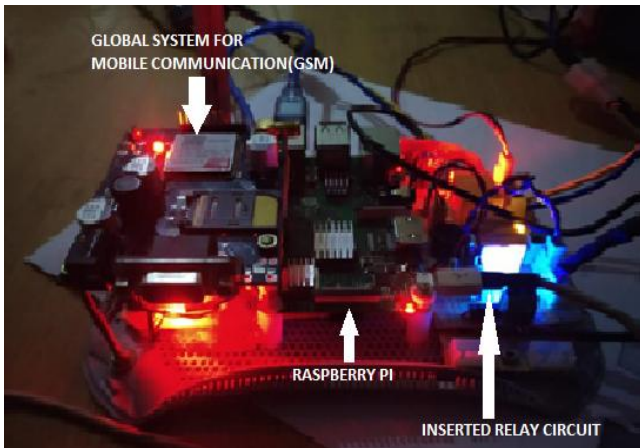**Figure 5: Circuit Diagram for Theft Prevention System**

Figure 6: Developed prototype of Theft Prevention System

IV. ACCIDENT ALERT SYSTEM

Now-a-days the utilization of vehicles like cars, motorbikes meeting mishaps can be happened due to over speed and careless driving. To diminish the accidents within the nation this paper presents a ideal arrangement. Programmed caution framework for vehicle accidents is presented; the most objective is to control the mishaps by sending a message to the enlisted user utilizing remote communications procedures. .To avoid such issues within the nation this paper presents an ideal arrangement Raspberry Pi which makes a difference in exchanging the message. The accidents can be recognized by a vibration sensor and Spinner sensor which is utilized as the mishap location module within the framework which was detailed in Figure 7.

Figure 7: Developed Prototype of Accident Alert System

Vibration sensor and whirligig /accelerometer will be enacted when the mischance happens and the data is exchanged to the registered number through GSM module as shown in Figure 8. GPS framework will offer assistance in finding the area of the mischance spot.
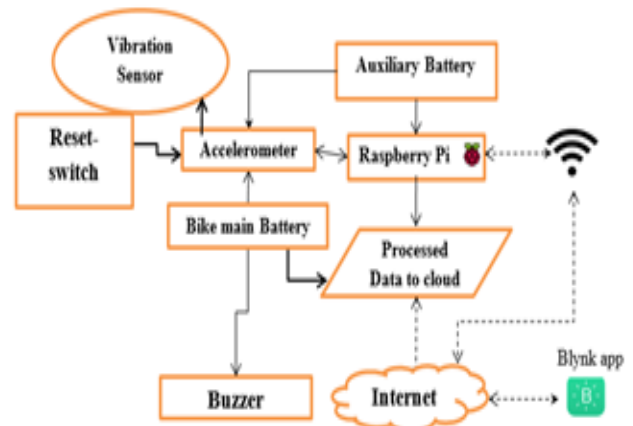

Figure 8: Block Diagram Representation of Accident Alert System

V. FUEL LEVEL INDICATION

Most of the motorbikes are willing to be utilized tried and true fuel within the bike which tends to assist client. The module developed in this work is effectively shows the fuel levels through mobile application to user for a given extend of fuel filled within the motorbike fuel tank appears in liters as described in Figure 9 and respective circuit diagram is shown in Figure 10. In case the fuel tank is filled with three liters is shows as three liters precisely. The ultrasonic sensor is a non-contact sensor, with low power requirement and good accuracy. By utilizing this framework, the accurate degree of petrol within the tank can be observed carefully by placing an ultrasonic sensor as described in Figure 11 when the motor bike is in inactive position.
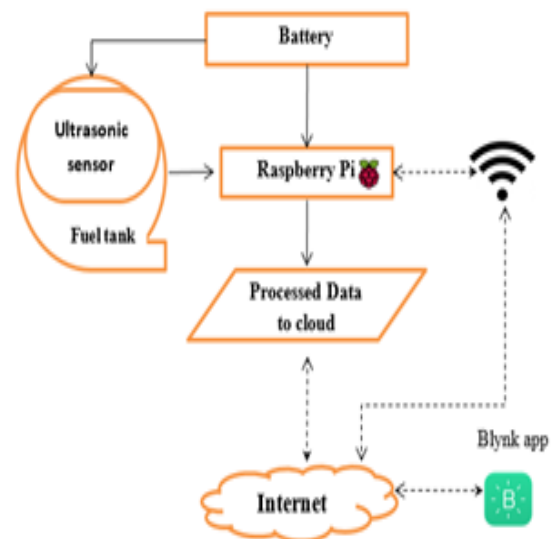

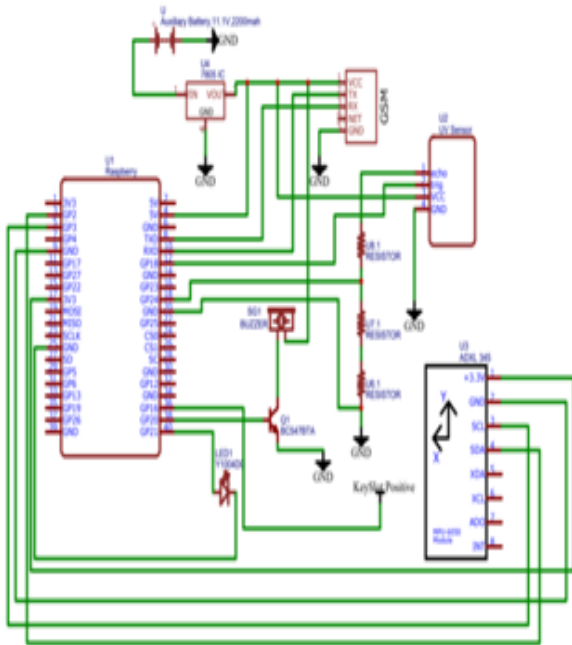**Figure 9: Block diagram representation of Fuel Level Indication System**

Figure 10: Circuit Diagram for accident alert and fuel indication system

Figure 11: Developed prototype of Fuel Level Indication System

Whereas this project is tested each hardware component is linked with the Raspberry Pi which embedded for a required output with circuit diagram furnished above in Figure 10.In this Analysis Raspberry Pi monitors each and every system with single handed and performs the given command reliable to the client.

VI. FUEL MONITOR UNIT

As an additional feature provided for Fuel Level Indication is "FUEL MONITOR UNIT'. The main theme of providing this unit is to avoid the stealing the fuel from Bike apart knowing from user. The Developed model is especially provided with an RFID key which acts as a key role for entire model. Whenever the bike key is placed the whole system gets operated. In this module we have developed with a solenoid based control unit (shown in Figure 12) which performs according to the data received from RFID Key. At the moment when Key is placed in slot the RFID transmits the whole data for entire operation of two wheeler. Thus the solenoid valve gets activated and allows the fuel to pour into the engine. Even if the duplicate key is placed, the system does not performs operation until original RFID key is inserted.

Figure 12: Developed model for Fuel monitor unit

VII. FIND MY BIKE

The proposed additional module is most relevant to the user in terms of parking the two wheeler. It is found the users are mostly suffers to find the bike when they are placed huge parking area like Railway stations, Cinema hall and at any large events. Especially it will become a complicated to find the two wheeler in Night times in a parking area. So this module helps to identify the bike where placed with the help of Google assistant as described in Figure 13. Generally if the voice request is given to the Google assistant it gives the location where the bike is placed whereas the bike gives buzzer sound with lighting for easy identification by user.

Figure 13: Google assistant used to find the bike

VIII. RESULTS

With the help of proposed module, the theft identification will be notified to the vehicle owner whenever the vehicle is moved by unauthenticated persons or trying to steal by someone so that the vehicle owner can stop the vehicle from his place itself. The current location of the vehicle also notified to the vehicle owner. Another proposed module titled accidental notification unit will make the alert and share the current vehicle location to the registered mobile numbers whenever accident is met by a user. The electrical solenoid proposed for the fuel tank allow the fuel to enter into the engine only when proper key is placed in the bike slot and it avoids the fuel theft. Similarly, ultrasonic sensor based fuel indication unit assures the correct notification about the fuel availability. Smart control regarding finding the bike in crowded area and ON/OFF the bike ignition is made possible in this work with the help of google assistance. This proposed work completely make the bike system as smart system.

IX. CONCLUSION

As a part of Conclusion the final model with suggested systems is concluded to play as a real time solution for two wheeler associated with extra features. The developed system is fixed into a two wheeler and checked all possibilities to lookout the hidden system to place the project to be aware from any third party user or thieves to keep safe of equipment like a Black Box in Airplane. Whole system performs three major operations via mobile application and performance of Google Assistant at any time. The Mobile Charging port is also provided in the system with an existing methodology. Keeping observations there is no any vibrations are found while driving and user can easily handle the mobile with adjustable port which helps user to make use of Maps and other functions without any disturbance. As an additional feature with enhanced advancement Google assistant plays an important role for whole system to find the Bike in large area, to shut down the bike whenever the keys are took away by any unknown user, finding the live location by Google Maps. Keeping Focus on the upcoming Technologies getting engaged the developed model is focused on future research operations as a High Secured system with efficient management at any kind of situations. Hence these model is further kept on Research and developed for a good output.

ACKNOWLEGEMENT

REFERENCES

1. Shikalgar Parvin, Suraj Shivaji Sutar, Akash Nandkumar Suryawashi, Mr.Prasad Hindurav Zambre, Mr.Abhijit shivaji kashid, "Vehicle Theft Detection and Tracking Based on GSM and GPS", International Research Journal of Engineering and Technology (IRJET), Vol. 04, No. 03, pp. 1085-1090 2017.
2. T Kalyani, S Mounika, B Naresh, Mahendra Vucha "Accident Detection and Alert System", International Journal of Innovative Technology and Exploring Engineering (IJITEEE), Vol. 8, No. 4S 2, pp.227-229, 2019.
3. Bike Handle Lock Breaking and Starting Bike without Keys available from https://www.youtube.com/watch?v=8dwSzkTKMbE.
4. Archie O. Pachica, Dhave S. Barsalote, Jessy Mae P. Geraga, Jhestine M. Ong and Michael D. Sajulan "Motorcycle Theft Prevention and Recovery Security System" , International Journal of Applied Engineering Research ISSN 0973-4562, Vol. 12, No. 11,pp. 2680-2687, 2017.
5. K.L.S. Soujanya, Sri Sai Rajasekhar Gutta "Accident Alert System with IOT and Mobile Application", International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Vol. 7, No. 5S2, pp.337-340, 2019.
6. How to start the bike without using keys available from https://www.youtube.com/watch?v=ArAAmgai3fk
7. Mrs. P. Geethabai L. Deepika, M. Dharani, P. Haripriya, G. Lavanya "Design and Implementation of GSM Based Digital Fuel Meter and Fuel Theft Detection Using PIC Microcontroller" IOSR Journal of Electronics and Communication Engineering (IOSR-JECE) e-ISSN: 2278-2834, Vol. 2, pp. 11-14, 2017.

AUTHORS PROFILE

Rafi Riyaz was born in Andhra Pradesh in 1998.He completed Intermediate in 2016 and his Under Graduation in Electrical and Electronics Engineering completed by 2020. Author is interested on Automation with Vehicles and linking with upgraded software.

Rithin.K.Thedevos was born in Kerela in 1997.He completed Intermediate Education in 2015 and his Under Graduation in Electrical and Electronics Engineering completed by 2020.Author is interested to work on complete hardware designing and testing of vehicles.

Aareesh Joshy was born in Kerala in 1998.He completed Intermediate Education in 2016 his Under Graduation in Electrical and Electronics Engineering completed by 2020.Author is interested on working with Software in Cloud Computing Technology

B Madhu was born in Andhra Pradesh in 1998. He completed his Education in Diploma on Electrical and Electronics Engineering in 2017 and his Under Graduation in Electrical and Electronics Engineering completed by 2020.Author was interested on Electric Vehicle Design and Raspberry Pi Testing.

Ramesh Komarasamy was born in Tamilnadu on 1981. He received B.E. degree in Electrical and Electronics Engineering from K.S.R.College of Technology, Tamilnadu, India in 2002, and M.E. in Applied Electronics from Kongu Engg. College, Anna University, Chennai in 2005 and also received the MBA in Systems from PRIDE, Salem (Tamilnadu), India in 2005. He received his Ph.D. degree in Information and Communication Engineering from Anna University, Chennai, in 2014. At present, he is working as Professor in Kuppam Engineering College, India. He is a life member of ISTE, a member of International Association of Engineers (IAENG) and a member of International Association of Computer Science and Information Technology (IACSIT). He is acting as a reviewer in IEEE Transactions on Industrial Electronics, IETE Technical Review, Journal of Vibration and Control, Journal of Computer Science, Indian Journal of Science and Technology and he is acting as an Editor-in- Chief in Transactions on Engineering and Sciences. His fields of interest include model order reduction, controller design, optimization Techniques and renewable energy conversion systems.