

Bus Accident Alert using Arduinio Mega Board

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Abstract:- In the highly populated country like India the need of proper bus transportation system is very essential. At the same time, it is also threat to human life because of the occurrence of bus road accidents. It is not possible to avoid it completely but a system can be introduced on a bus to reduce the consequences of road accidents. This paper introduced a paper, in which the GPS technology will spot the accident location and inform the server through GSM. The server will receive the location and immediately sends the information to the nearby hospital for emergency help as ambulance accident location.

Keywords:- GPS, GSM, Arduinio board, Visual Studio 2010, Microsoft Access.

1. INTRODUCTION

With the glowing population, the need of transportation system becomes essential. With the increased number of transportation systems, the likelihood of accidents becomes further more. It is not always possible to avoid the accidents but the consequences of such road accidents can be reduced. In high-tech Volvo buses some safety facility systems will be available but the normal regular buses in such safety system

This paper aims to introduce a safety facility system that can reduce the consequence of accidents by sending the accident location details to the server through GPS (Gable Positioning System). The area pin code of the accident location will be compared with the stored pin code in the server database. Once the pin code matches, the information is passed to the authorized person of that location. And an immediate safety facility will be provided to the victims to rescue them.

In this system, the GPS technology is used to discover the accident location in the form of latitude and longitude coordinates. These coordinates will be sending to server through GSM (Goble System and Mobile communication). The information includes location name and area pin codes. In the server all the pin codes covering all area of the particular city will be pre stored. When the server receives the location pin code, it will compare the received pin code with all the pre stored pin code available.

If the received pin code matches with any of the available pre-stored pin code, the information will immediately be sent to the responsible authorized person. In such case, the authorized person will be immediately

sending the safety facility to an accident location. If in case the pin code does not matches with the available pre-stored pin codes, one default pin code will be available on the server and the location details will be passed to that particular authorized person and he/she will send the immediate safety facility.

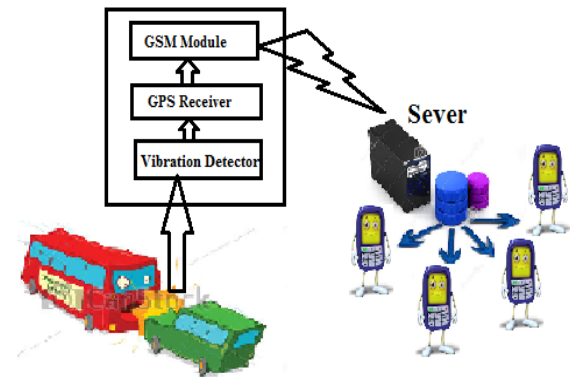


Figure. 1 Overall Diagram of Accident Alert System

2. LITERATURE SURVEY

In all proposed system, only GSM system is used to send the accident location details to the authorized person. The GPS will spot the accident location and microcontroller present in the bus will send this information to an authorized person mobile number through SMS by GSM. In some papers they will use internet as the medium to send the SMS alert, but it will take time to track the location and to provide the help to passenger.

To overcome the new system we introduced a server, which is pre stored with all pin code of different area of that city along the number of authorized person of those respective area will be stored in the database. It will minimize the time to search the accident location.

3. BLOCK DIAGRAM

The whole project will be dividing in to 2 parts.

1. The one unit is installed in bus, which contain Arduinio Mega board, Vibration Detector, GPS receiver, GSM module.

2. The other unit is connected to the PC, in which we create the accident alert windows application.

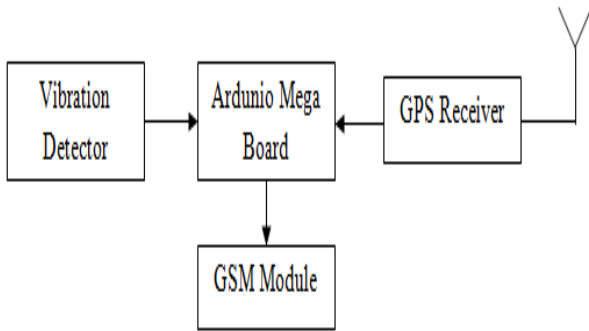


Figure. 2 Block Diagram of Bus Unit

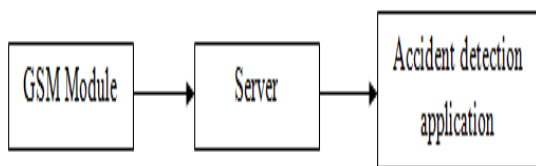


Figure. 3 Block Diagram of Server unit

Here we use the Microcontroller as Arduino mega board, which as the 4 set of transmission and reception pins, so it will be easy for connecting GPS and GSM module to microcontroller. Also it has pre boot loader, so load the code into the IC we don't need extra hardware programmer.

The vibration sensor will work on the principle of piezo element; it will be combined with the comparator so we will be set the sensitivity and threshold voltage. Whenever accident occurs, if the sensor voltage will be more than set voltage, the comparator will send the signal to microcontroller. At the same time the microcontroller will receive the exact location from GPS receiver. This information will be sent to the server through GSM module.

The Server will use the Visual Studio Software, in that we create the accident alert windows application and stored the different area pin codes along with respective authorized person of those location. This information will be stored in Microsoft Access work sheet, in that we can delete the content or change the content but these changes will be done by authorized person who has the password to access this application.

Whenever accident occurs the microcontroller will receive the location address from GPS receiver, through GSM module the information will be sent to the server. The server we create the accident alert window application. The server retrieved the pin code from received information and matches with the stored area pin code, if it matches it will send the alert message to authorized person which is stored in the database. If it doesn't match it sends the alert message to default mobile number. He/she will be responsible for providing the help for passenger. Also the

alert message will be displayed in the Accident Alert Application with location address in main office.

4. FLOW CHART

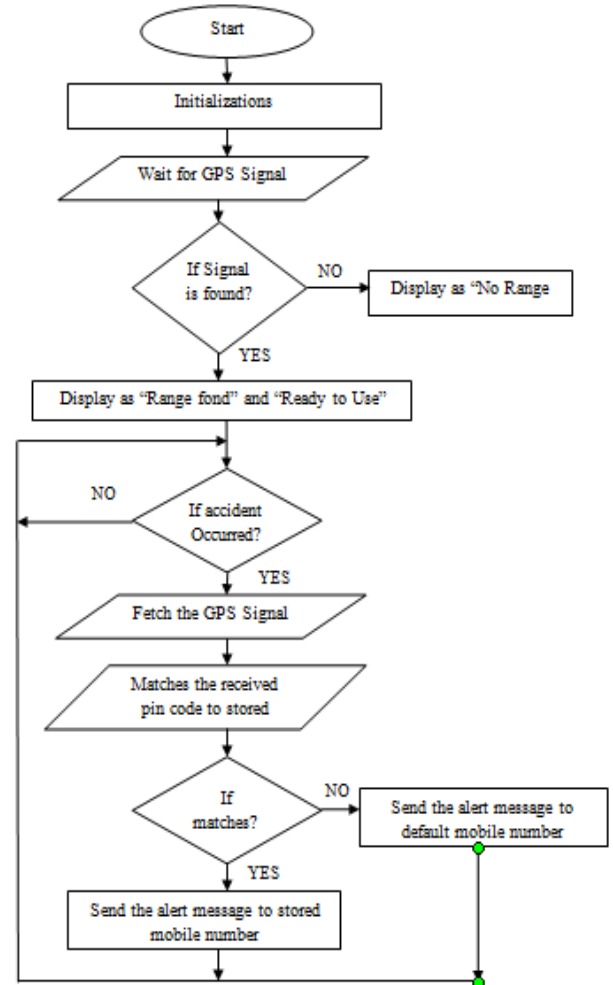


Figure. 9 Flow Chart of Detection of bus accident alert

5. RESULT ANALYSIS

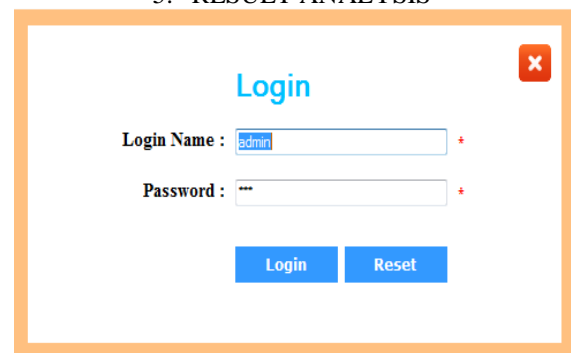


Figure. 10 Login window

In the application window we can store the different area pin code and respective mobile numbers. And save the detail, in data grid view we can see the details which we previously stored. These details will be stored in Microsoft Access sheet. If we want to make any change or update the details, we can do it in Access sheet and save it. It will

automatically change in the application. If any data will be delete we can also detect the record, but this details will be change or delete will be done by authorized person with the help of login id and password.

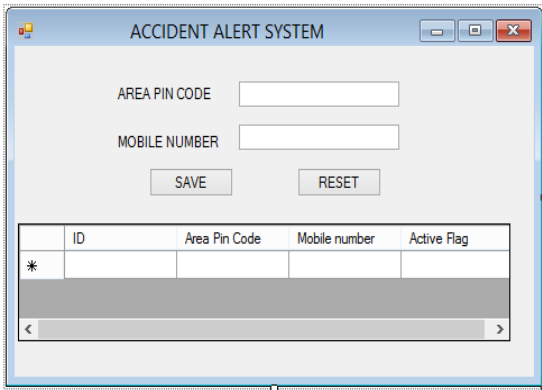


Figure. 11 Accident Alert application window

ID	Area Pin Code	Mobile num	Active Flag	Add New Field
1	575001	9449002932	1	
2	575004	9481546595	1	
3	575015	8154356635	1	
4	575028	9481049996	1	
*	(New)			

Figure. 12 M.S. Access data sheet

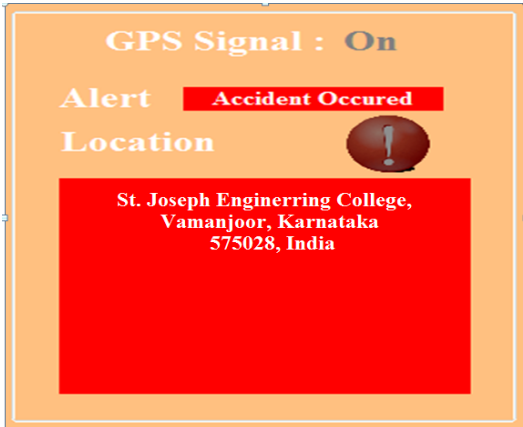


Figure. 13 Accident alert message display



Figure. 14 Message received in mobile

6. CONCLUSION

This paper mainly focuses on sending the accident alert message to main station along with the authorized person mobile number with location through GPS. The authorized person will responsible for sending the emergency help like ambulance and contact police station. Using the database will store the area pin code wise mobile number so it will be time consume for search the exact location when accident occurs. Using the database we can easily update the pin code and mobile number so doesn't need to remove the hardware component from bus to update the records.

7. FUTURE WORK

Instead of sending the alert message to particular authorized per mobile number, when accident occur the server will contact the nearby hospital number for ambulance help and send the information to police station.

8. REFERENCES

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