School van safety and surveillance system

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ABSTRACT

Now a day's school van accidents are increasing day by day. This is mainly due to the negligence of van drivers. The major causes of accidents are due to alcohol consumption by the driver, over-speed, etc. It's always a headache for the parents to think about the safer journey of their children. It would be very convenient if there is a system to decrease these types of accidents. This Project is a new idea to implement the different kinds of safety features in the vehicle. If the driver consumed alcohol then the alcohol sensor senses the consumption of alcohol and stops the ignition of the vehicle at that instant. It also sends a message to all the parents and the police station nearby with the exact location using a GPS sensor used in our project. If the speed of the vehicle crosses the specified limit system, first it gives an alarm to the driver to let him know that he is over speeding and if still, he continues, it sends alerting message to the parents and concerned authorities. In case of any accident takes place, that also will be notified to nearby police stations and parents of all the students inside the bus. This system sends the information to the parents about the arrival of the bus prior to one-stop, also parents can access the information about the current location of the bus anytime. The phenomenon of forgetting kids on the bus is one of the problems suffered by the children. This project, through the entry and exit recordings, aims to create a suitable environment by following a certain set of criteria of security and safety for school buses that will have a positive impact on the student and their family. When a complete prototype of the proposed system is implemented, the system will promise safer transportation of school children.

Keywords: Alcohol, GPS Sensor, School Van, Ignition

1. GOALS
Our project has various extra features apart from the above given existing projects. The main purpose of our project is to ensure the safety of the children travelling on daily basis. Our project has an RFID reader and each student is given a RFID tag so that when a student enters he should tap the tag on the reader so that his details gets saved on the current days database of students in the bus for any emergency. the main aim of our project is to notify the authorities concerned immediately if something wrong takes place . These people may be the student's parents, nearest police station, hospital and the school authorities. So when an accident takes place in a remote place we use a piezoelectric sensor on all sides of the vehicle so that when an accident takes place the piezo electric sensor gives the resistance output, which is given to the raspberry pi which we have used in our project. Then according to details stored in the CPU, the message that an accident has occurred will be sent to all the necessary authorities so that an action can be taken suddenly and danger can be avoided in most of the cases. The next feature our project has is it has an alcohol sensor which sensor, which checks the driver for any alcohol intoxication in him. If he is found drunk, the sensor sends details to the CPU, which send the message to the police, parents and the parents of student present inside the bus.

The third feature our project is that it has a speed testing unit to avoid some of the accidents due to over speeding of the vehicle. So we have a speed sensor in our project, which keeps track of the speed, the vehicle is moving. The speed sensor is connected to a buzzer and when the vehicle crosses 80 Km/hr he buzzer will ring and the driver will get alerted. After that also if the driver continues, the output of the speed sensor will be transferred to the CPU so that a message will be sent to authorities. The last feature our project has is that there will be a display for the driver so that he will know about whom all are present inside the bus and their details so no one will be left back inside the bus. Only when the second time the student taps the RFID it is know that the student has got out of the bus and it gets reflected in the display for the drivers notice. The key novel feature of the proposed methodology is the use of energy efficient systems to support the tasks. Though not within strictly in the scope, the same data can be used to assess the time of departure and arrival, number of students travels each day.

2. APPROACH
This prototype consists of alcohol sensor, speed sensor and piezoelectric sensor to monitor whether the vehicle is on over speed, crashed or to check whether the driver is drunk or not. RFID scanner is fixed in the van, which is used to collect the information

about the student entering the van (like student's parent phone number, address etc.) from the main database. When the student enters the van each one should scan their tags on RFID reader. The details of the student in the van is displayed on an LCD display and when the student gets down also he/she should tap the RFID so that the driver knows that the student has got down. Finally when the bus reaches the destination, the driver can check the display so that he can get to know if there is any student left inside the bus. These input values are fed to the system CPU that is Raspberry pi 3 as it is quite efficient and has a modern interface. These input values are processed in the CPU. When the values from the sensors exceed the saturation level, CPU creates a caution message in the database. Each caution message varies with according to the sensors values. The processed message is sent to the GSM modem. The van location is traced for a certain interval of time and the location is transferred to the GSM modem. All these processed values from GSM are shared to the required authorities and parents to ensure the students safety. This prototype is powered by the vehicle battery and starts once the vehicle is on. The Raspberry Pi Foundation provides Raspbian OS. It provides Python as a main programming language. It is a closed source, while open source is also available. Many other OS also runs on the Raspberry Pi. This is modern time software due to which the programming would be much easier and efficient.

3. METHODOLOGY AND WORK PLAN
3.1 Block Diagram
The model to be developed has the following system:
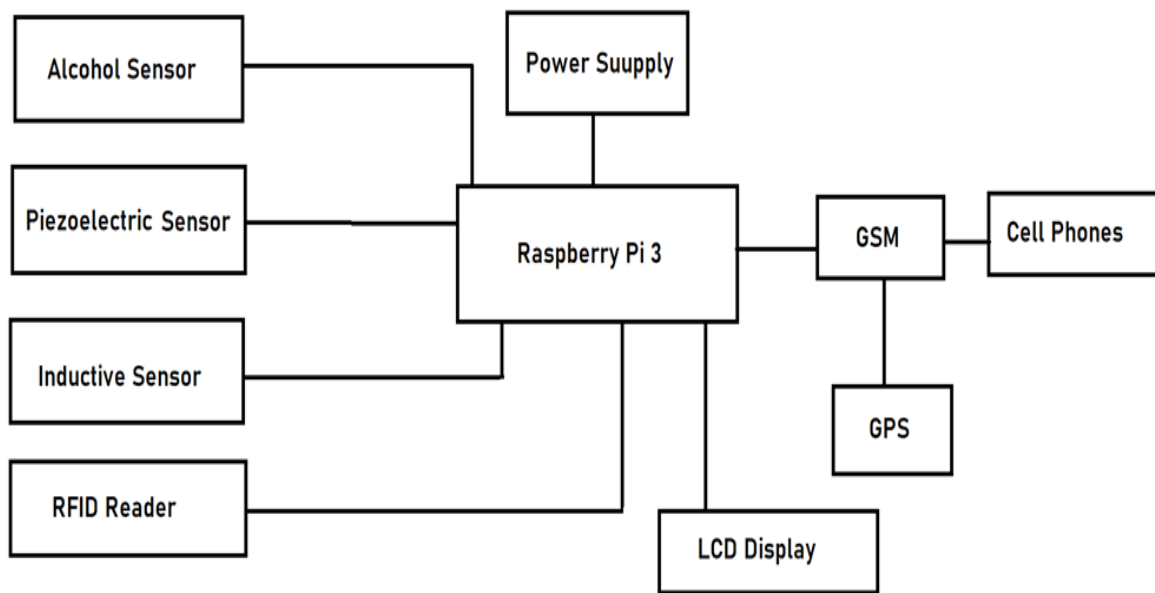
As given in the block diagram , we use Raspberry pi 3 as our CPU . All the sensors including alcohol sensor, piezoelectric sensor , inductive sensor , RFID reader is connected to the CPU . Power supply is given to the CPU. An LCD display is connected to the CPU to know the student details. The GPS connected is used to get the exact location of the van and the GSM is used to send alert messages to the concerned authorities if required under any circumstances.
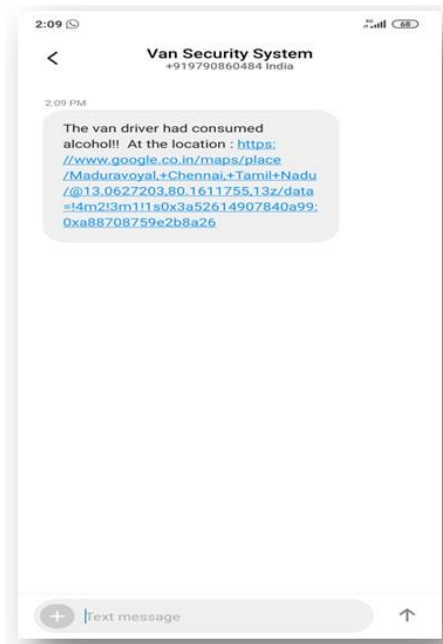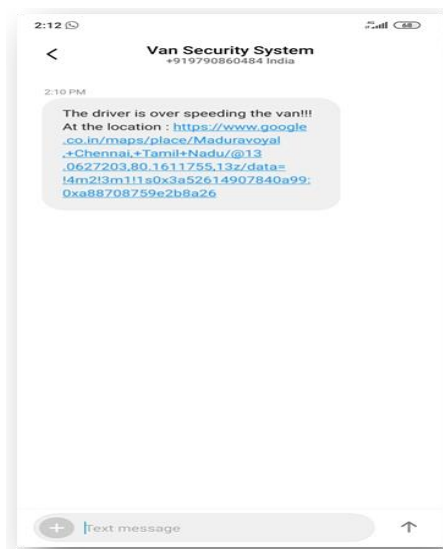
3.2 Flow Chart
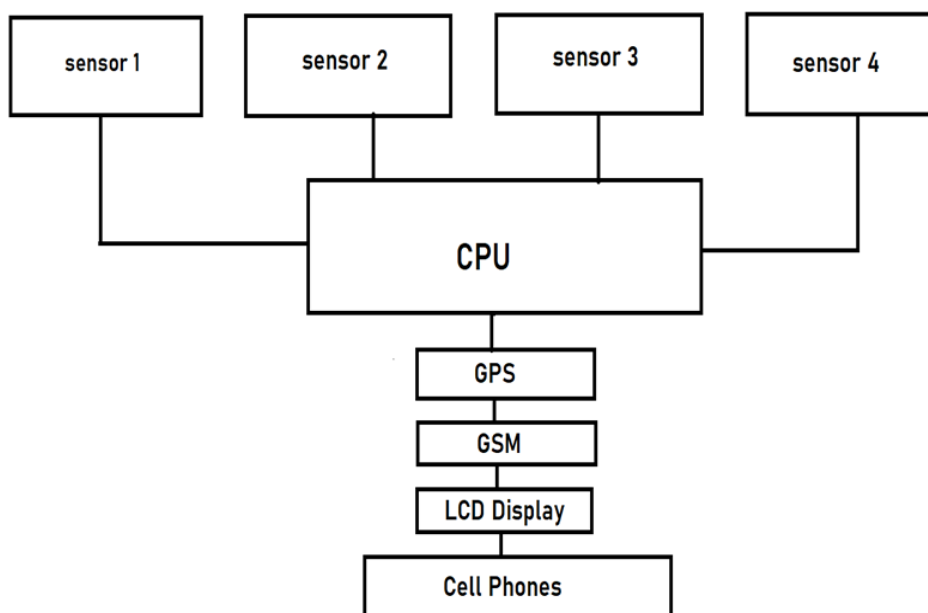
3.3 Output
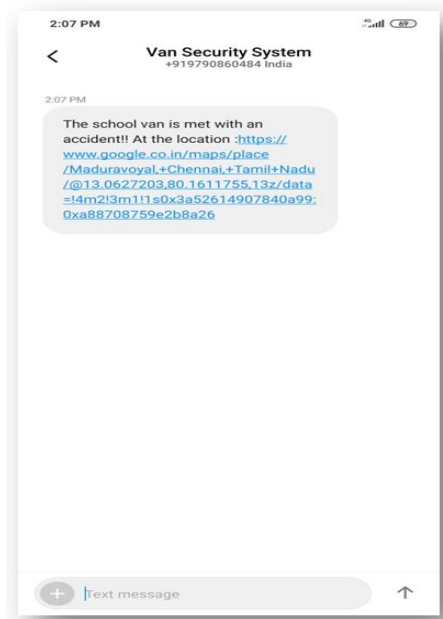
Alert message for accident

Alert message for drunken driving

Alert message for over speeding

4. RESULT AND CONCLUSION

The alcohol sensor installed in the bus senses the alcohol consumption of driver and if it is above the threshold level SMS alert is sent to the authority and the. The inductive sensor accurately measures the speed of the vehicle. Any accident occurred will be sensed by piezoelectric sensor and sends alerting message to the concerned authority. The display kept inside the bus helps the driver to ensures that all the students got out of the bus and ensures safety. The integration of all these safety systems in the school van leads in total security of school going children and also any parent can extract information about the current status of the bus at any time.

As we were gathering the information from different sources, we had an idea why not to make them all in same circuit. Hence, we came with conclusion making this Minor Project.

After successful completion, we are working loads improving or developing the project This prototype show's that School Van Safety and Surveillance System is feasible for supervising and tracing student during their drive to and from school. Also, the speed control, drunk and drive prevention and accident emergencies plays a major role to improve student safety.

5. FUTURE SCOPE
• By developing the mobile application live tracking of school bus can be implemented
• To overcome the delays due to traffic in cities, real time clock can be used to know the exact time of the arrival of bus.

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