Design and Implementation of SMS Based Child Tracking Model

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Abstract: **The school van may lose a child without correctly knowing about his/her target place. Especially a new van driver does not know each child's step off location. The child may feel sleepy when his/her step off location crosses. This project proposes a novel child kidnap protection system with the help of RFID tag arrangement and GPS facilitated school van. In this novel technique, the child can hold & swipe RF ID tag on the school van while he/she hires the school van. After swiping the tag, the stored database information about the child's residential address and its landmarks can be retrieved. While the school van starts, the GPS system starts recording the position of the school van and also alerting the location of school van to the each parent as a SMS. By the way of doing this alert, the parents can vigilantly note down the current location of the school van.**

Keywords: **RFID, GPS, GSM, Transportation Safety, Embedded Systems**

I. INTRODUCTION

School buses transfer millions of children daily in various countries around the world. While there many issues that might disturb the parents regarding the travel safety of school going children, the paper intends to look into introducing access safety in respect of school buses through bus tracking system that will help the school children's transportation in a secure and safety way.

The supervision of the regularity of students during their entry and exit from the bus is difficult to be controlled by drivers, which led to endangering child safety. The phenomenon of forgetting kids on the bus is one of the problems suffered by the children, which has increased significantly in recent years. This has often led to death of many students on account of suffocation due to the lack of animation of drivers.

This project through, entry and exit recordings, aims to create a suitable environment by following certain set of criteria of security and safety for school bus that will have a positive impact on the students and their family. The paper proposed a bus safety system which was designed to control the entering/exiting of students from the bus using RFID. This paper includes vibration sensor for detecting accidents and alert sends to the ambulance. The temperature sensor is used for fire detection.

II. LITERATURE SURVEY

M. Loganathan proposed a geo-fencing campus, a child module and a parent module. The geo fencing campus is to find the location and to track the child movements. Once the child is out of the campus a message will be sent from the child module to the parent module which alerts the receiver. We have also introduced a sensor to detect the child emotions. And mostly concentrated on when the child cries [3].

P.Mankar proposed a SMS based solution using GPS system to aid parents to track their children location in real time. Nowadays, most mobile phones are equipped with location services capabilities allowing us to get the device's geographic position in real time. The GPS and GSM based systems are used to track the location of Child. It helps the parent to get their child's location on a real time map [8].

Anwaar Al-Lawati proposed a system to monitor pick-up/drop-off of school children to enhance the safety of children during the daily transportation from and to school. The system consists of two main units, a bus unit and a school unit. The bus unit the system is used to detect when a child boards or leaves the bus. This information is communicated to the school unit that identifies which of the children did not board or leave the bus and issues an alert message accordingly.

III. EXISTING SYSTEM

System Design

Our system is designed with the following engineering requirements:

- The system should recognize each child and detect when every child boards or leaves the bus.
- The system should have a database to store student's information.
- The system should be easy to re-configure.
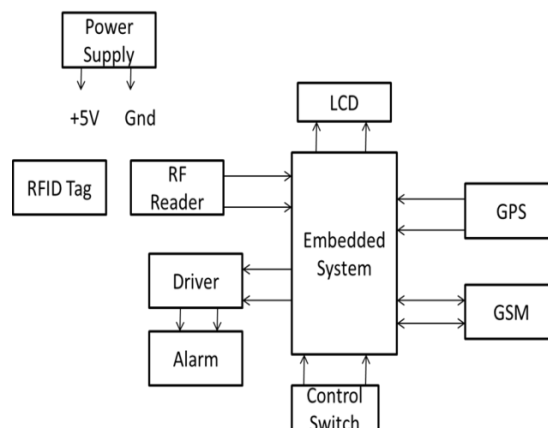- The communication should be reliable.

Fig 1: Block diagram

IV. PROPOSED SYSTEM

In proposed method we develop a safety system for school children's. RFID Tag will be fixed in the id card of a student and the signal transmitted from which will be received in the bus unit which is an RFID reader and it will be monitored in the server which is present in the school unit And also message will be transmitted to their parent's mobile number through GSM. Their position of child tracked through GPS and sends to their parents during on entering and exit of the child in bus. Vibration sensor is for detecting the accidents of the bus if the value will reaches maximum level alert will send to ambulance. In case fire will created in bus. Fire exhauster will be open by Motor. The proposed architecture is shown in figure 1.
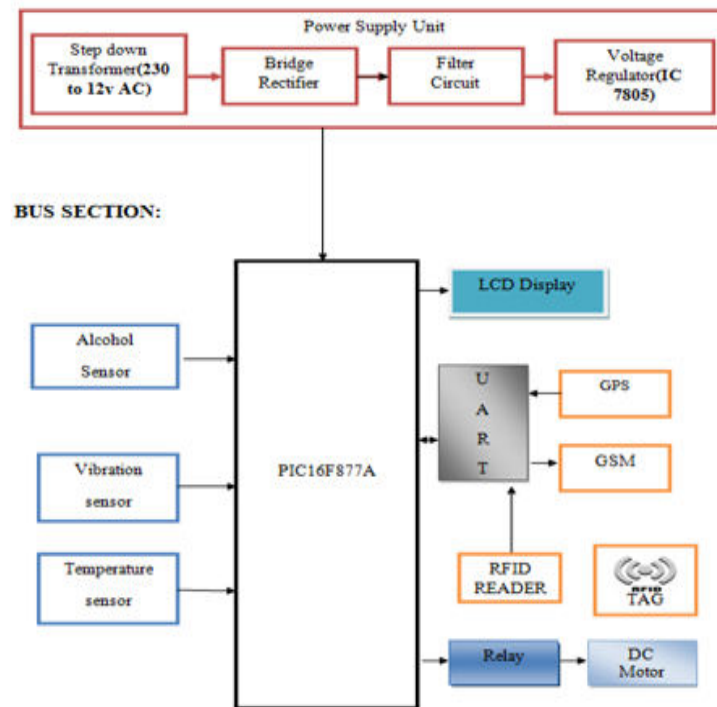

Fig 2: Proposed System unit

Our proposed system provides the following advantage:
- It reduces unwanted accident.
- Easily identify the vehicle location.
- Drunken drivers are identified.
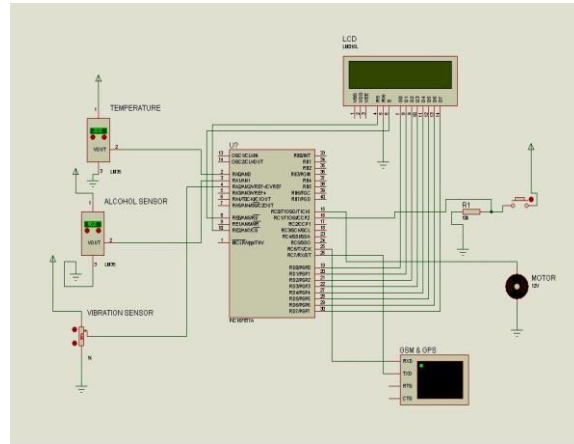- Accident location will identify quickly.

Fig 3: Circuit Diagram

Bus Unit

The bus unit will detect the children when they board/leave the bus. It will use RFID technology to achieve this purpose. This technology consists of a reader and tags. The RFID reader will be located inside the school bus by the entrance. It will be positioned where it will only detect the children when they are inside the bus. But if the child was outside near the bus, the reader will not detect him. Each child will wear a card with RFID tag attached to it. The bus unit is responsible for sending relevant tag information to the school unit where it will be stored and processed. Based on the received information, other related child's information can be retrieved from the database for further processing.

School Unit

The school unit consists of a server interfaced with GSM modem to receive data from the bus. The server simultaneously acts as database server and web server to host the web-application developed to manipulate the system setting, update, and query the system database. In addition, the server communicates with an SMS gateway to send notification in case a child is detected missing.

A. RFID

➤ RFID (radio frequency identification) is a technique facilitating identification of any product or item without the requirement of any line of sight amid transponder and reader.
➤ RFID Structure is continuously composed of 2 main hardware components. The transponder which is located on the product to be scanned and the reader which can be either just a reader or a read & write device.
➤ RFID Tag – The actual data carrying tool of an RFID structure, in general comprise of an antenna (coupling element) and an electronic micro-chip.
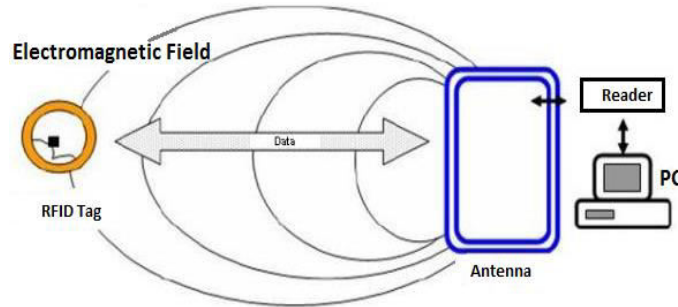
Fig 4: RFID

B. GPS

GPS stands for Global Positioning System and was developed by the US Department of Defence as a worldwide navigation and positioning facility for both military and civilian use. It is a space-based radio-navigation system consisting of 24 satellites and ground support. GPS provides users with accurate information about their position and velocity, as well as the time, anywhere in the world and in all weather conditions. GPS provides specially coded satellite signals that can be processed in a GPS receiver, enabling the receiver to compute position, velocity and time. Good GPS receivers can calculate their position, anywhere on earth, to within one hundred metres and can continuously update their position more than once a second.
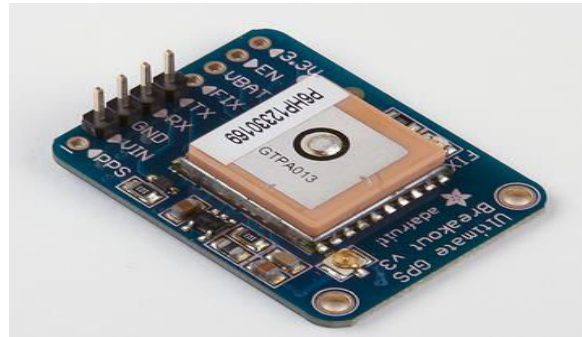

Fig 5: GPS

C. GSM

GSM is a mobile communication modem; it is stands for global system for mobile communication (GSM). The idea of GSM was developed at Bell Laboratories in 1970. It is widely used mobile communication system in the world. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands. GSM system was developed as a digital system using time division multiple access (TDMA) technique for communication purpose.

Fig 6: GSM MODEM

D. Temperature sensor

Temperature is the most-measured process variable in industrial automation. Most commonly, a temperature sensor is used to convert temperature value to an electrical value. Temperature Sensors are the key to read temperatures correctly and to control temperature in industrials applications. In the temperature functional module we developed, we use the LM35 series of temperature sensors. The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Fahrenheit temperature.
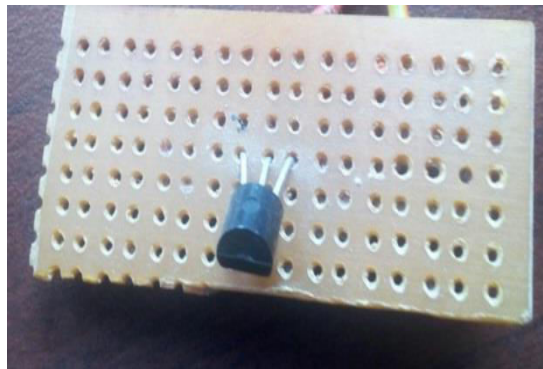

Fig 7: Temperature sensor

E. Vibration sensor

Vibration sensors are used in a number of different projects, machines and applications. Whether you're attempting to gauge the speed of a vehicle, or to gauge the power of an impending earthquake, the device you're likely using is considered to be a vibration sensor. Some of them operate on their own, and others require their own power source. Various machine operating conditions concerning temperature extremes, magnetic fields, vibration range, frequency range, electromagnetic compatibility (EMC) and electrostatic discharge (ESD) conditions and the required signal quality necessitate the need for a variety of sensors.

Fig 8: Vibration sensor

F. Alcohol Sensor

Alcohol sensor is a chemical optical sensor utilizing the acidic nature of alcohol for detection. It consists of a gas-permeable membrane in which a pH-sensitive luminescence dye is immobilized together with a buffer and an inert reference luminescent dye. Alcohol permeating into the membrane changes the internal pH of the buffer. With this changes the luminescence of the pH-sensitive dye. Together with the inert reference dye internal referencing is made for detection of the luminescence lifetime of the sensor. The measurement signal detected by the alcohol mini correlates to the partial pressure of alcohol ambient.

Fig 9: Alcohol Sensor
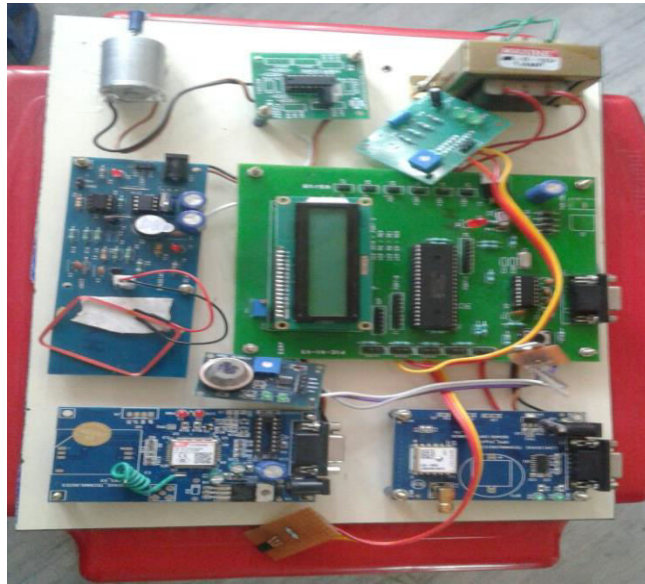
V. RESULTS AND DISCUSSION
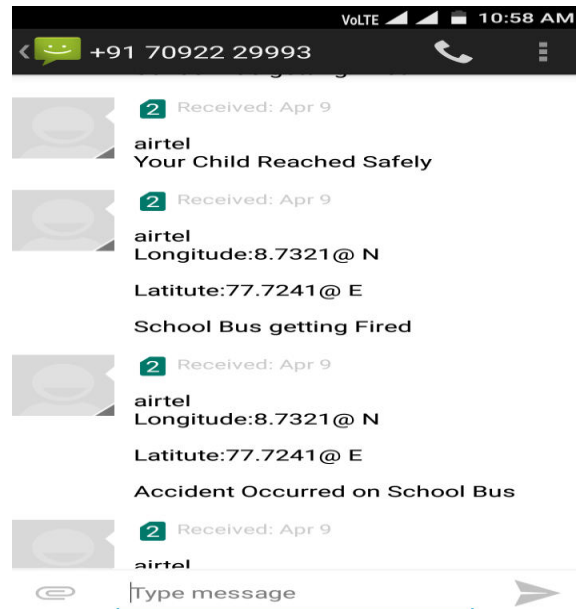

Fig 10: Hardware unit

Fig 11: Alert message to the parents

When RFID enables one the child reached message will be send to the parents. Temperature sensor will reaches the maximum value fire detection alert send to the parents. If the driver consumed alcohol, it will detected by the alcohol sensor and alert will send to parents along with the location of the bus using GPS & GSM.

VI. CONCLUSION

This project implementation primarily focuses on tracking a child's position and its location is sent to its parent and control room. It can be extended to perform the same for all children in the school by reducing the size of the child module. This project focuses on recording a child's location. In conclusion, this system was developed to locate children for their parents and this research showed that GPS tracking technology is a practical option for monitoring and tracking the children during their trip to and from school & on school busses. This research presents design and implementation of PIC based children tracking system. It primarily focuses on tracking a child's position and monitoring transportation of the child is sent to its parent and control room.

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