

Implementation of Children's Tracking and Safety System Using Internet of Things - IOT

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Abstract –This paper presents 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 existing systems are not powerful enough to prevent the crime against children since these systems give information about the children group and not about each child resulting in low assurance about their child safety to parents and also does not concentrate on sensing the cry of the child and intimating the same to its parents. To lessen the parent's anxiety about their children, a vehicle positioning system is formulated by merging Radio frequency Identification (RFID) and Global Positioning System (GPS). This system consists of RFID readers and tags which are designed to scrutinize the entry and exit of a person in a vehicle. Each person is assigned with a tag which holds the precise details. When he/she enters the vehicle, the reader reads the person's tag and stores the details of entry and exit. This information is notified to the concerned authority via SMS using GSM. The proposed system facilitates to know about the area where the vehicle has crossed the path using RFID tags and positioning using GPS.

Index Terms: RFID tags, RFID readers, GPS, GSM

1. INTRODUCTION

Children safety is of utmost importance to their parents. Despite the best safety measures, children, due to their lack of skills to protect themselves, may end up in a situation that endangers their life. The aim of this paper is to develop a Bus Safety System which provides the details of entry and exit of the student from buses using RFID and GSM technologies. The proposed system provides a facility to track the exact location of the bus using RFID and GPS in a cost effective way. So this could be implemented even in small scale schools. Such systems must be installed in order to reduce the number of abduction taking place. This paper presents a system to monitor the daily bus pick-up/drop-off of children to enhance the overall safety of the daily bus transportation to/from school. The system aims at automatically detecting when a child boards or leaves the bus and issue an alert message when a child does not board or leave the bus to reduce the parents' concerns about using the bus for the daily transport of their children without being lost or forgotten. The proposed system includes tracking the child's movement to and from school. The information pertaining

to missed child is sent to control room of the school as well as to their respective parents, if they move beyond the coverage area. Not only the information about the child's whereabouts but also whether the child is crying is sent to parents through text message to their Android mobile device.

2. LITERATURE SURVEY

A system[3] that includes a child module and two receiver modules to track the children who is missing. It also sends information about the child cry through text message to parents. It uses Voice Recognizing sensor to sense the cry of the child. When it matches the cry of the child which is stored in school, it sends the message to parents. The main drawback is the whole system is integrated in a small chip and attached to the person body. It may harm the child. The child module includes ARM7 microcontroller, Global positioning system (GPS), and Global system for mobile Communication (GSM), and the receiver module includes mobile phone device in parent's hand. Finally, implementation results for the proposed system are provided in this paper. The Authors Medhat Awadalla, Dawood Al-Abrie, et al in [2] presented the system to enhance the safety of the school children to and from school. This system is used to detect when the child board or leaves the bus and gives an alert message to parents. In this[1] era, safety is the foremost concern among parents. To lessen the parent's anxiety about their children, a vehicle positioning system is formulated by merging Radio Frequency Identification (RFID) and Global Positioning System (GPS). The system consists of RFID tags and readers which are designed to scrutinize the entry and exit of a person in a vehicle. Each person is assigned with a tag which holds the precise details. When he/she enters the vehicle, the reader reads the person's tag and stores the details of entry and exit. This information is notified to the concerned authority via SMS using GSM. The disadvantage of this paper is that we can't track the school bus if the school bus gets late to drop the children at the respective places. It uses Voice Recognizing sensor to sense the cry of the child. When it matches the cry of the child which is stored in school, it sends the message to parents. The main drawback is the whole system is integrated in a small chip and attached to the person body. It may harm the child. Another children tracking system using android based phone for getting information about the missed child is proposed [4]. The paper [5] focuses on children tracking system which includes panic button. In any dangerous

situation, the child is supposed to press the panic button. It uses Bluetooth technology to communicate among mobile terminals which collects information and delivers to server using wireless LAN. A module which is enclosed in the children's ID card is in the form of chip. The problem is that the child might never know that he should press the panic button when it requires. The system [7] is designed to track the children while entering and leaving the bus using RFID and GSM Technology. If the students get missed in the school bus the information will be sent to the school. The shortcoming of this paper is only the entry and exit of the student is identified. Children tracking system using android mobile device [6] includes child module and two receiver modules. The database is maintained in the control room of the school. If the child goes beyond the coverage area the information is sent to control room of the school and also to the parents. It uses wireless LAN and Bluetooth device to collect information. The limitation is the cluster head sends the information about the children group and not about each individual. This makes difficulty for the parents to identify their child information.

2.1 Existing System:

The RFID & GSM based system helps in tracking the vehicles. The communication between the vehicle unit and the main server is achieved using Zigbee. This security system is simple and cost effective. RFID technology is an emerging technology in the field of construction of roads which has extensively grown in intelligent transportation systems (ITS). Each student is given with the RFID tags which contain the details of the student, contact person and their phone number etc. The RFID reader, kept in the bus, will read the serial number of the tag that contains the details of the students. The information read is stored in the microcontroller and sent to school server via GSM modem. Once the tag is read by the reader simultaneously a message is sent to parents.

2.2 Proposed System:

A RFID tag contains the details of the area, is placed in the bus stop. Once the reader reads the tag the information is sent to school server via GSM modem and a message about the current location of bus is sent to the parents. Usually the bus tracking system consists of GPS system but it provides only the LAT and LAN value. But usage of RFID provides the Figure 1. Block diagram of existing work exact location of the bus as the tags are pre-programmed. The school bus tracking system which contains RFID reader module, GPS receiver, GSM modem. Each student is given with RFID tag which holds the information of the student such as name, parent's mobile etc. When the student enters or leaves the bus the reader reads the tag information, stores it in the microcontroller and message is sent to parents and school unit.

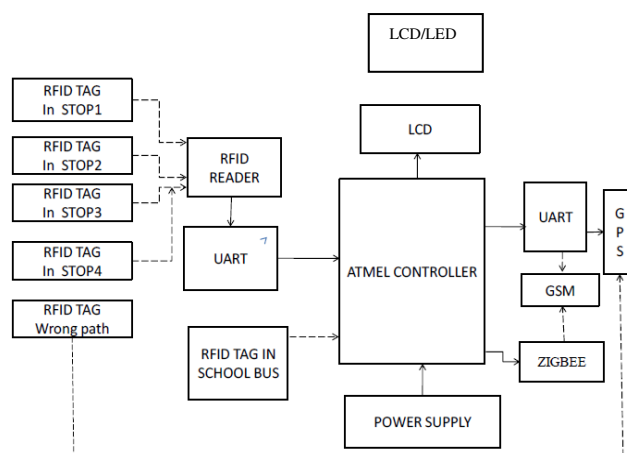


Fig -1: Proposed Architecture

3. SOFTWARE AND HARDWARE REQUIREMENTS

3.1 Microcontroller

The Atmel microcontroller is used to maintain the school bus tracking system. The microcontroller is compatible with the industry standard 80C51. It is applied for its low power, high performance and non-volatile memory technology. The program can be modified any number of times and dumped into microcontroller because of the on-chip flash memory. The GPS is used for tracking the school bus. A software program to control them is written in the Embedded C language which is compiled and then saved into the microcontroller's flash memory.

3.2 KEIL μ Vision 4: The program to be stored in the microcontroller is developed by the keil μ vision software. It is used to compile and debug the 8051 program which is written in C. The keil software is used to combine project management and run time environment. It is used to build facilities, source code editing and program debugging. It is user friendly and working operation is simple.

3.3 GPS

GPS is a multiple – satellite based radio positioning system in which each GPS satellite transmits data that allows user to precisely measure the distance from the selected satellite to his antenna and to compute position, velocity and time parameters to high degree of accuracy. GPS delivers with high sensitivity and accuracy with low power consumption. GPS module design is flexible to accommodate various RF interference.

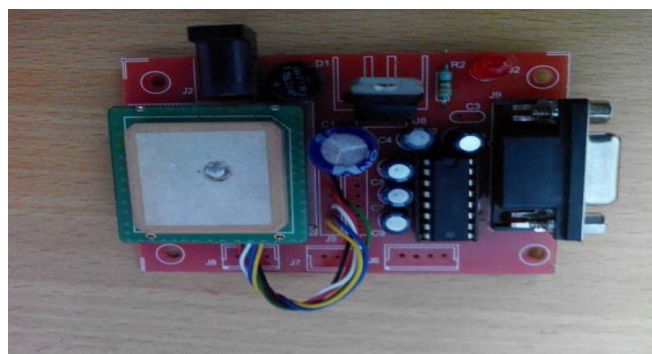


Fig-3.3: GPS

3.3 GMS

The advantage of GSM is, its international roaming capability in over 100 countries, improved battery life, an efficient network design for less expensive system expansion, an efficient use of spectrum, advanced features such as short messaging and caller identification ID, a wide range variety of handsets and accessories

5. RESULTS

The school bus tracking system which contains RFID reader module, GPS receiver, GSM modem. Each student is given with RFID tag which holds the information of the student such as name, parent's mobile etc. When the student enters or leaves the bus the reader reads the tag information, stores it in the microcontroller and message is sent to parents and school unit. The tags on road contains the specific location information is also read by the reader and stored in the microcontroller and send SMS via GSM. If the bus travels other than the usual path, it can be tracked using GPS in fig 6. This database is updated in the school server. The database will be created in the school where details of every student are stored. The parents can go through the database at any time for further details.

CONCLUSIONS

This project implementation primarily focuses on tracking of a child's position and its location is sent to his/her parent. This security system endeavors the safety transportation for the school children during daily outing. The system uses RFID for detecting the child whether boards or leaves the bus along with the stopping (boarding place) of the children. The message will be sent simultaneously to the parents and the school. The details of the boarding and leaving the school bus will also be updated in the school database. The GPS used is to track the position of the bus if it goes other than the usual path

REFERENCES

- [1] A.Nanseen Fathima, P.S.Nivedha, T Sangavi, S.Selvalakshmi, R. Chaitra " Vehicle Tracking System for Children Safety Using RFID, GPS and GSM," international journal for trends in engineering & technology volume 13 issue 1 – may 2016 - issn: 2349 – 9303.
- [2] Anwaar Al-Lawati, Shaikha Al-Jahdhami, "RFID-based System for School Children Transportation Safety Enhancement" 978-4799-8422-0/15/\$31.00©2015 IEEE
- [3] G.Bharathi, L. Ramurthy in "Implementation of Children tracking system using ARM7 Microcontroller" International Journal of Industrial Electronics and Electrical Engineering, ISSN: 2347-6982 Volume-2, Issue-12, Dec.-2014.
- [4] P. Santharaj, V. Anuradha in "Design and Implementation of Children Tracking System using ARM7 on Android Mobile Terminals" International Journal of Scientific Engineering and Technology Research ISSN 2319-8885, Vol.03, Issue.21, September-2014
- [5] PoojaMankar, HitaliNasare, PrachiPatle, MeenalMahadole, PranaliBorkar, Swati Gupta in "Implementation of children tracking system using mobile terminals" International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 4 Issue 1, January 2015
- [6] S. Santoshgoud, K. Nishakarin "A self-configurable new generation children tracking system" International journal of professional engineering studies volume iv/issue2/oct2014
- [7] Maryam Said Al-Ismaili, Ali Al-Mahruqi, Jayavrinda Vrindavanamin "Bus Safety System for School Children Using RFID and SIM 900 Modem" International Journal of Latest Trends in Engineering and Technology (IJLTET) Vol. 5 Issue 1 January 2015 ISSN: 2278-621X
- [8] <http://blogs.wsj.com/indiarealtime/2012/10/16/india-s-missing-children-by-the-numbers/>
- [9] <http://timesofindia.indiatimes.com/city/chennai/Drive-r-kidnaps-drowns-2-kids-in-Coimbatore/articleshow/6844599.cms>
- [10] <http://www.geosynthetica.net/rfid-smart-geosynthetics-roads/>