Vehicle Attendance and Monitoring System

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Abstract - *A system monitors the daily transportation service for school going children to enhance the security and safety of the children. The system consists of three main units, bus unit, parent unit and school unit. The bus unit consist of hardware parts. The bus unit is used to detect when a child enters/exits from the bus using RFID Card. This information is communicated to the parent unit and school unit that identifies the children did/did not enter/exit the bus. The notification like the students whose next stop is, sent to the parent. The system enhances the security of the children like the bus hijacked, extracting the location and instantly sending notification to the admin. The system develops an android application for the parent for getting notifications and live tracking of the bus and web-based application for the admin that facilitate the management and provides useful information about the children and some specific details like routing, allocating stops, scheduling, optimized route and reports. The system tracks the school bus by the GPS Module and also gets an alert if the bus crosses the speed limit.*

Keywords: RFID, GPS Module, SMS, Bus stop, NodeMCU, GSM module, etc

1. INTRODUCTION

School children safety is the most significant component encouraged to precede research with the support of advanced technology. Several bitter incidents forced to develop an innovative methodology to provide secure life for children. Parents are unable to feel comfortable until the child comes back to home safely. Missing of the students at school premises, anti-social elements kidnappings etc. are increasing in an advance. Technology should be imperative to safeguard the society. One of the important aspects is transport using buses and vans. Generally, this transport is arranged through the local transport vendors on a yearly contract basis, recently happen mishaps such as burglary, rape cases etc. The development of satellite communication technology is easy to identify the vehicle locations. Hence, we need a technology to provide safety to the students on their way to school and back.

2. LITERATURE REVIEW

A literature review has shown there are many studies introduced i.e. a system to monitor pick-up and drop-off service of schoolchildren to raise the value of the security of the children during the daily transportation from and to the school. A system has a developed web-based database driven application that facilities its administration and provides useful information about the children to authorization. This system major drawback is it uses web-based application for admin and parents too. Parents could not able get notify easily in convenient and safer manner. Another research introduced a system that monitors children inside the bus in a safer manner. It uses the combination of RFID (Radio Frequency Identification), GPS (Global Positioning System) and Wi-Fi technologies. Each student carries a unique RFID card embedded in each of the student's school bags. When the student enters or exits from the bus the reader records and transfer data in the database. Another research introduced the system which gives the real time notifications about location of child using GPS Tracker. It also identifies the child by the Biometric Identification method. This system disadvantage is full casual and difficult for the children to place their any body part detection correctly on the scanner. This may also handle to an inappropriate data if the scanner did not detect the child's body part.

Another research shows an efficient and systematic way of using RFID tracking applications coupled with smartphone technologies to fulfil the key security and monitoring purposes. In order to optimize the proposal, this paper investigated the effects of variable localization of RFID tags from reader and power loss, inefficiency and distance constraints caused due to equal power allocations to the tags. Reducing the number of readers by using smart antenna and increasing coverage area, several other sectors will be hopefully able to leverage the benefits of RFID technology and smart antenna using adaptive algorithm. Finally, complete content and organizational editing before formatting. Please take note of the following items when proofreading spelling and grammar.

3. PROPOSED SYSTEM

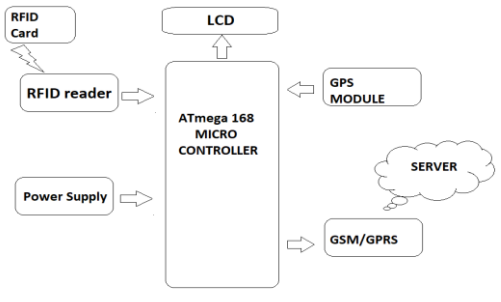

Fig-1: Block Diagram of System

Figure above shows the block diagram of proposed system. The scanning unit is fitted at the entry of the bus. The bus unit will detect the children when they board the bus. It will use RFID technology to achieve this purpose. When the correct RFID card is scanned by the respective student, an SMS is sent to the registered mobile number and the information is updated on the server at the same time. Our system also consists of a Motor-Driver that rotates only when the correct information is received by the RFID reader. This motor can be attached to the automated door of the bus to ensure that only students with an authorized ID card can enter the bus. The contents of the SMS are: Student details and GPS location. A GSM module is used for the purpose of sending each parent the details of their ward's attendance

The parents receive the live GPS coordinates of the bus when their ward boards the bus. The server is accessible to the school authorities. All the information about the bus and the status of students present and absent is updated automatically. The entry of a student onto the bus will be displayed on the LCD. The entire system is driven by a Microcontroller. The RFID reader starts scanning when the bus reaches the first bus stop. The LCD then displays a timer for 10 seconds within which the boarding student should scan his card. This same process is repeated for the next bus stops. Based on the received information from the RFID tag the parent is notified via text message on their phone whether the child boards or leaves the bus. The GPS module installed in the bus keeps a track of its location all the time and simultaneously updates the server thus integrating with the NodeMCU.

Fig-2: Hardware Components

4. RESULT

The web-based server updated the data of various students pre-fed into our system as and when they entered/exited the bus, monitored by the passive scanning of RFID cards. The data included live location of the bus on the route created and saved, credentials of the respective students along with their present/absent status.

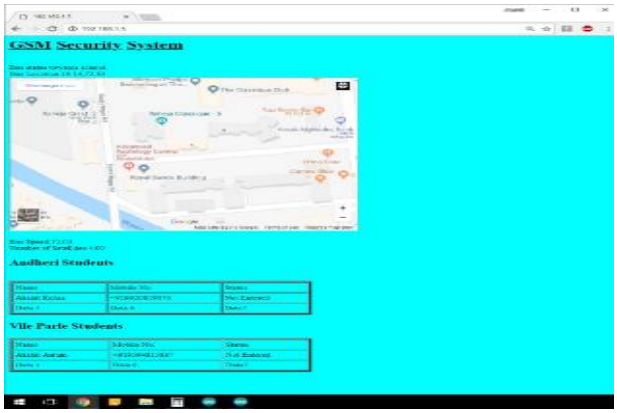

Fig-3: Server Monitoring

The automatic updates were sent by text messages to school authorities and the parents with the live location of the bus at every junction point, pre-fed into the system.

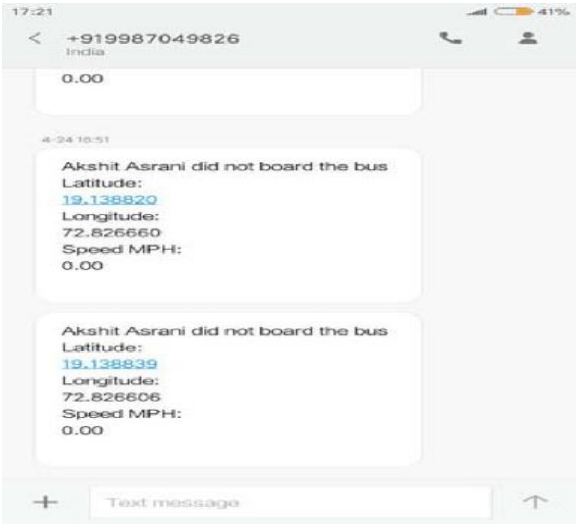

Fig-4: Text message sent to Parents

5. CONCLUSION AND FUTURE SCOPE

Problems occurred now days for child's safety have become a major concerning issue for the parents and school too. This proposed system aims at enhancing the safety of children during the daily transportation to the school and from the school. RFID Reader located inside the bus detects the RFID tags of the child. It sends instant notification with the relevant data from the school database server via internet. The system checks and detects each and every activity, problems and notifies to the parents and school authorities about the specified activity. The parents can log into the Server and monitor the details of their children and track the location of the bus. The system deals with live tracking of the bus. Hence we were able to send several individual messages to each parent to notify them about their wards activities.

Future scopes include Geo-fencing that sends SMS alerts when bus nears a pick-up/drop-off point, Active RFID tags,

camera for live monitoring installed in the bus connected to the server and Android application linked to the database for a user-friendly experience to parents and school authorities.

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