IoT Based Biometric School Bus Attendance and Tracking System

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ABSTRACT- In the current period due to the increase in the number of road accident and kidnapping cases, parents always worry about their children. This paper recommends an android based solution which helps parents to track their children location in real time. To track the location GPS of android application is used and to identify the child a biometric identification is used which is inbuilt in the system. Whenever a child boards a bus, the biometric identification is done in the bus and the system will identify the child and update login server will send to the parents consisting of the current location and time. Parents can see the location of the bus, they will be notified when the children are getting into the bus or getting down from the bus.

1. INTRODUCTION

School bus plays an essential role in carrying most of the children every day all over the world. While there are several problems that might disturb the parents with respect to the travel of school going kids; the paper aspires to look into initiating the safety with respect of school buses through bus tracking and security system that will help the school kids' transportation in a protected and more secure way. The circumstance of forgetting kids on the bus is one of the problems suffered, that has risen considerably in recent years. This has often led to the demise of many students due to suffocation.

A main disturbing fact about India's missing children is that while on an average 174 children go missing every day and half of them remain untraced. The National Crime Records Bureau (NCRB) report which was cited by the Ministry of Home Affairs (MHA) in the Parliament (LS Q no. 3928, 20-03-2018) is more than one lakh children (1,11,569 in actual numbers) were reported to have gone missing till 2016, and 55,625 of them remained untraced till the end of the 2018 year[16]. This system, through the entry and exit recordings, intends to create an appropriate environment via following a certain set of criteria of security and wellbeing for the school transport that will have a positive impact on the safety of children's. Road

accidents are rising day by day. Major parts of these mishaps occur due to rash driving or over speeding of the vehicle. The speed control mechanism will help in limiting the speed of the bus. The system is designed using a single microcontroller which will reduce the hardware size and so the cost. The paper also suggests a bus safety mechanism which is designed to count the entry/exit of students from the bus.

Aim:
The main aim of our project is to improve the security of children when they are going to school from home or from home to school by sending the child status to the parents and school. If the child is not present on the bus while going from school to home then alert SMS will be given to the parent immediately so that they can take necessary actions as soon as possible. This system really helps in improving child safety using IoT technology.

Objective:
The main objective of our Android application "IoT Based Biometric School Bus Attendance and Tracking System" is to track the children's location when they are going to school or while returning back to home. By tracking the children's location we are able to know whether the child is safe or not. If there is an emergency situation than an alert indication will be given to the school and the parents immediately. our application improves child safety when going to school or home from school.

2. STUDIES AND FINDINGS

Raja Godwin D, Abisha blessy E, Dhivyapriya K, Koodeswari B, Seshavardhan S[1], proposed a smart bus tracking system has been proposed that when any student enter into bus the alert message will send to their parents and also arrival times, buses current locations, and bus routes on a map can be easily found out with the help of IoT. GPS (Global Positioning System) and Google maps are used for navigation and display services respectively. GSM (Global System of Mobile Communication) used for sending an alert message[1].

Arifa K, Aryadas R, Asha KR, Amrutha J, Anju P[2], design a system to monitor children ridership in a safe and non-intrusive way. It uses a combination of RFID, GPS, GPRS technologies for monitoring entering and exiting of students. Each student is issued a unique RFID card to carry. As the student's tag is detected by the reader installed in the school bus upon entering or leaving the bus, the time, date and location are logged and transmitted to a secure database. It will require no action on the part of drivers or students, other than to carry the card and will deliver the required performance without impeding normal loading and unloading process[2].

Shraddha Shah, Bharti Singh[3], suggests a bus safety mechanism which is designed to count the entry/exit of students from the bus. The system does various tasks, such as recognizing unique information of each student using RFID tag, which will interchange the data with the RFID reader by means of radio waves and display each student's name on the screen. This will let the driver to know the number of students boarded the bus. Moreover, it also has an emergency switch which driver can use in case of emergency. As the driver presses the switch the message will be sent to school authority and parents which will notify them of an emergency. In addition, if the bus departure and arrival is accomplished successfully from the source to destination, it will inform parents through an SMS about their successful departure and arrival[3].

Abhilash Kanakanti D Narendar Singh[4], The proposed system consists of two parts one is the hardware part and second part is software. In this hardware part divided into two parts that is each student carries a card which contains an unique identification number, when the student enters the school bus, before that he should scan his card, as soon as he will scan the card a message will be sent through GSM to his parents that their student has gone to school along with time and location[4].

3. PROPOSED WORK

The project intends to look into introducing access safety in respect of school buses through the bus tracking system that will help the school children's transportation in a secure and safer way.

- GPS on the bus side
- Android app for parent
- Arduino Mega controller
- In & out the scan for child 4 times and for driver and attendant 2 times
- Each time notification on an app with the time and location in the form of text
- Route track of bus - display on the Android app
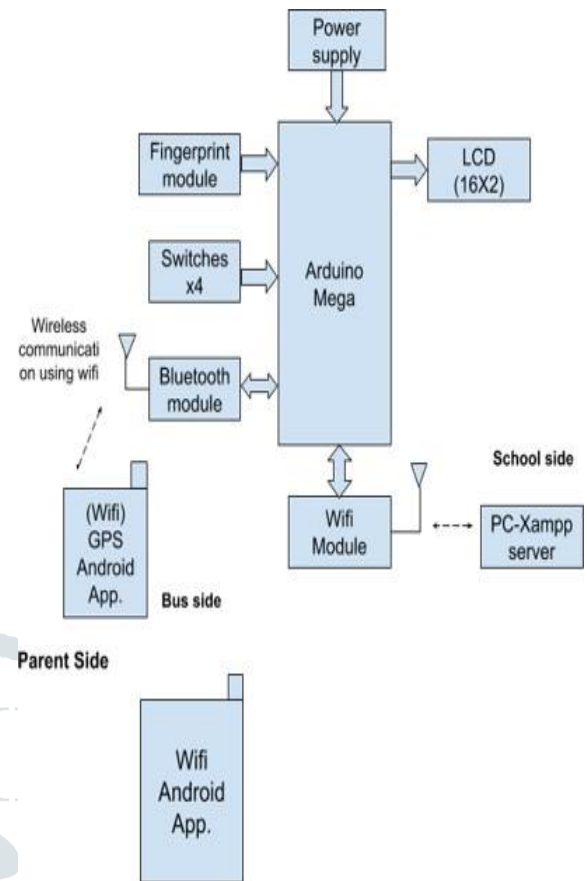- 16x2 Lcd display for displaying bus location, fingerprint scanned and bus route.

Fig 3.1 Block DIagram

Blocks of System Design:

- Arduino Mega controller-ATmega 2560
- Fingerprint module-R30511
- Wifi module - ESP8266
- Bluetooth Module-HC-05
- LCD - 16x2
- Switches
- Power supply

4. CONCLUSION

Combining Fingerprint, GPS and Android advances for safety and security reason are incredibly vital. Presently, as a result of an increase in mishaps of kids getting out at wrong stations or children getting missed out at the bus this may lead to demise due to suffocation. This proposal shows that android based school bus tracking technology is a feasible alternative for supervising and tracing the children's during their drive to and from school.

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