

Real Time Tracking of Child in School Bus using GPS and RFID

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Abstract— Many researches on real-time vehicle tracking is conducted, like wise tracking a school bus is important, sending a child to school by bus can be wracking for parents. It is important to know if their child has boarded the right bus, safe on it and reached a correct destination (i.e school) on time. According to the statistics conducted by world health organization (WHO).In India about 41% of children die due to lack of road transportation safety. This paper presents a reliable real time tracking system using global positioning system (GPS), global system for mobile communication (GSM) services and RFID or smartcard, which keeps real time tracking of child at all time. Parents can log in into their mobile or web to track the bus to know whether the bus is running late and minimizes the time children to wait at bus stop by which less time to be exposed to be exposed to criminal predators by receiving sms alerts and mobile notification, bad weather or any other dangerous condition avoided to the child.

Keywords— tracking, global positioning system, global system for mobile communication, RFID, Google map API.

I. INTRODUCTION

There is a huge demand for tracking devices, which is actually considered a life saving devices. These devices keep track of children and update about the real time tracking to their parents. During the time of disasters, these system helps the parents to track their children location. According to hind[1] tracking provides several services like stolen of assists, to keep track of the behavior of the employee at workplace environment.

Parents must know about child safety in school bus, sending a child to school by bus is a wracking for their parents. The parents should know whether the child has boarded the bus, safely reached the school the school, found the right bus to reach home on time. To keep the real time tracking of children by using the GPS installed in school bus make parents to be bit relaxed on their safety while travelling in school bus by installing such safety components make bus and child tracking easier and safer- includes accountability, increases the convenience and savings.

Providing safety measures to their children while travelling in school bus is a important concern for parents by using GPS tracking, GSM services and RFID or smartcard make parents to relax on their ward safety by using these components for real

time tracking using which parents can login anywhere to find the location of bus and child on their mobiles or web.

II. SYSTEM IMPLEMENTATION

The GPS receiver will receive the location co-ordination(longitude ,latitude, speed, device data) from the satellite with the resolution (frequency) based on the user requirement like 10 readings/minute in NMEA format will contain raw data with huge information. The microcontroller processes the raw data information according to the algorithm present. The location co-ordination instructs the GSM modem to provide serial communication to server(database).

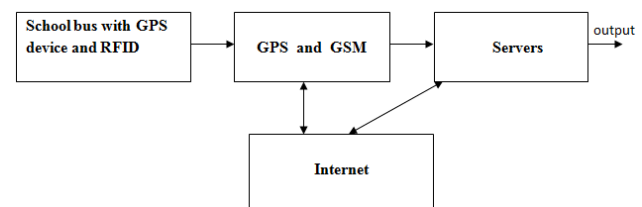


Figure.1:Block diagram of School bus tracking

Figure.1 shows the overview of the tracking system installed in the school bus.

RDID is used find the child login and logout from the bus. There are two types of RFID namely active and passive RFID. In which active RFID reader will be centralized in the bus. In Passive RFID reader will be installed at door.



Figure.2 :RFID integrated GPS tracking device.

The raw GPS data collected from the device installed in the school bus will send it to the NMEA server at the reconfigured timings (i. e 10 readings/minute).

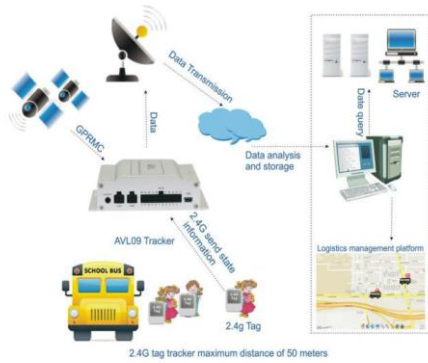


Figure 3 :Tracking Architecture.

In figure 3 shows the tracking architecture in which the GPS device is installed in the school bus would provide raw GPS data to the NMES server would parse the input raw data and output will be sent to server and this data will be computed based on the sms logic the message will be triggered to the parents. The parents can login with mobiles or web to access this location information.

To access their child location information the parents will be given with the Id and password. If the driver exceeds the limited speed the alert can be generated to the administrator.

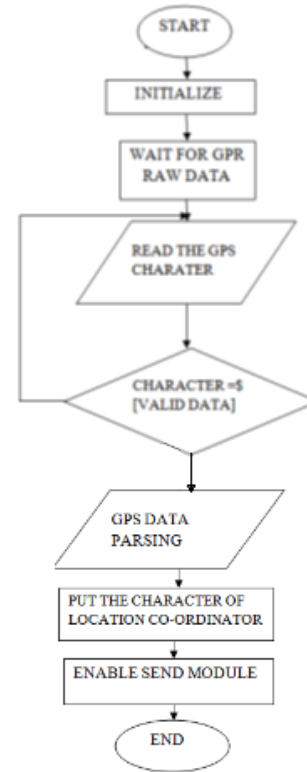


Figure.5 : NMEA server flowchart.



Figure.4 :view of location in mobile.

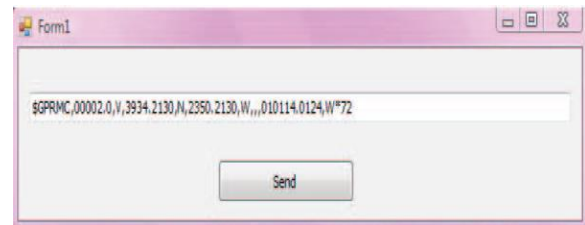


Figure.6 :NMEA of GPS receiver.

The NMEA server would get the raw data(unreadable form and encrypted form) of GPS as input and parsed output.

Child /parent information with valid stop, mobile number route information in the server. We consider this information as a static data.



Figure.7 : Message Architecture

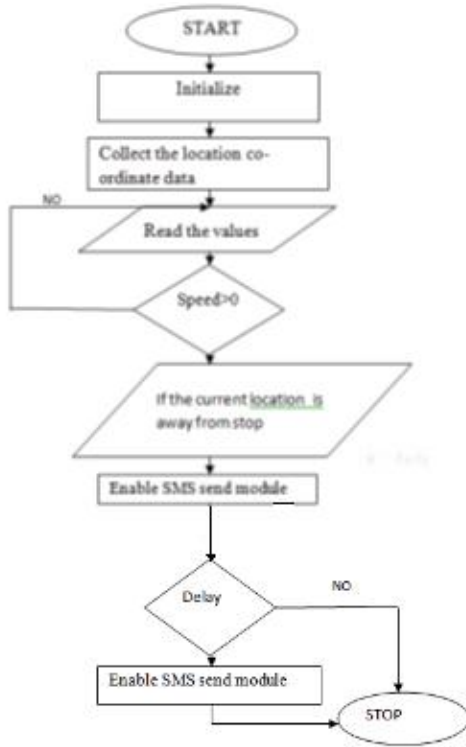


Figure.8: Message flowchart

In the figure 8 of message flowchart if the current location of the bus with the stop point (coordinate) is calculated. If the distance of the stop travel time is less than 15 min the SMS for parents will be sent. If the bus does not reach the stop within designated schedule time delay message will be sent.

III. CONCLUSION AND FUTURE WORK

The RFID and GPS tracking is designed and implemented in the school bus, parent can track their children location provided with more reliable information about the boarding and departed of the child. The location coordinates (latitude, longitude) will be converted by Google API.

This system will work on system GPS accuracy which will depend on whether condition and satellite coverage, delay in tracking message provided to the parents about their ward.

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