MICROCONTROLLER BASED BUS TRACKING AND PEOPLE SAFETY ENHANCEMENT SYSTEM

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ABSTRACT

A lot of children need to commute between homes to school every day. In recent days safer transportation of school children has been a critical issue as it is often observed that, the child is forgotten in the bus and also find that the bus being diverted from actual route. The proposed project " IOT based College Bus Tracking and Student safety Enhancement System" enables the user to find out the bus location information so that the user does not get delayed, and also locate the entry and exit of students from the buses through RFID and GPS.

The proposed system uses RFID (Radio Frequency Identification), GPS technology to track the current position of the bus, and Wi-Fi to delivering it to server from where it will be fetched by android application, and the bus real time location can be viewed on Google map, which is integrated onto the android application. Here the parents also can view bus locations of student entry and exit positions using android application. This applications are user-friendly and flexible to use as it is a time saving application to the user.

1. INTRODUCTION

School/college buses transfer millions of children daily in various countries around the world. While there are many issues that might disturb the parents regarding the safety transportation 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/college Children transportation in a secure and safer way. The supervision of the regularity of students during their entry and exit from the bus is difficult for the drivers, which led to endangering child safety. It has been increasing significantly in recent years. 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 student and their family. Android has become very popular in embedded market for two main reasons. First, it is open source software and moreover there are no royalty fees for Java VM (Virtual Machine. Second deriving from the first, Android is highly suitable for expansion as the developer sees fit. Being students ourselves, we have been motivated to develop this project for the benefit of the student masses, by the idea of providing an easier means of accessing various web resources related to the college bus, thus providing them with a better, richer experience of travelling to college. Further, the recent advent and popularity of Android technology motivates us to create an Android application for the same.

The students and the faculty use the college bus to travel to the college and back. The problem that arises is that the student or the faculty may not know the exact location of the college bus. And that's where this application comes to picture. This system will make use of Wifi and GPS modules to give exact and real time location of bus and for that we are using a microcontroller along with wifi and GPS module.

To achieve automatic Vehicle Location system that can transmit the location information in real time, Active systems are developed. Real time vehicular tracking system incorporates a hardware device installed in the vehicle and a remote Tracking server. The information is transmitted to Tracking server using wifi/GPRS modem on GSM using direct TCP/IP connection with Tracking server through wifi. Tracking server also has wifi/GPRS modem that receives vehicle location information via internet and stores this information in database. This information is available to authorized users of the system via website over the internet [1].

GPS will give the longitude and latitude values and that values are transmitted to the server with the help of Wifi internet modem. Once the longitude and latitude values are uploaded on the server, the user with the help of android application will be able to download it from server and get the real time location of the college bus, which he can see it through the Google maps integrated in it.

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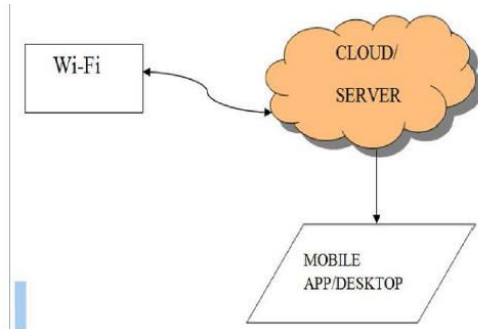## A Peer Reviewed Open Access International Journal

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Fig1.1 General diagram of proposed system

2. RELATED WORK

In [1] system uses the autonomous clustering technique to monitor the children in group and when separated. Each child is provided with an android mobile with them. A group of students are indicated as G. When this group G comes near to the tag T, it collects the group ID and sends to the server through mesh network. It uses Bluetooth to send the information which is one to one. If communication between neighboring mobile is interfered then collision occurs. In system deals with tracking children using android mobiles. It uses ARM7 processor with GSM, GPS and voice play back unit. The ARM7 triggers voice play back unit when the child cries. If the voice is matched it sends the alert message to their respective parents. Parents

can also view the child location in the android mobiles through google maps. Special application called eclipse is created in the mobile which can create new applications (SMSMAP).[2] Provides safety to the students in the bus stops using Intelligent Transportation System Telecommunication Technology(ITST).Here the Intelligent Bus Stop (IBS) detects the RFID tags of the students and indicates the student's presence in bus stop to the passing vehicles by a sign board with a flash light. It also indicates the cars by showingH symbol in the GPS.

System will handle, safe route planning, rerouting of routes, school bus position tracking, safety enhancement applications for drivers, warnings for surrounding vehicles and training schemes for school bus drivers. The average speed of cars was significantly reduced by the flashing bus stops. The evaluation will focus on usefulness, effectiveness, acceptance in a user perspective.

3. EXISTING SYSTEM

In the existing system, the user does not know the exact location of the college bus and whenever he needs to know about

the location, he has to call and ask someone. Sometimes, the bus may also get delayed by few circumstances such as traffic congestion. Then the user will not be able to decide whether the bus has arrived or not. Due to this, the user may face many problems such as late arrival to the college. The ability to track the vehicle over the internet is done by utilizing Global Positioning Satellites. Data such as Global Position, Speed Velocity and Time (PVT) are transmitted over the Cellular network. The information transmitted from the tracking device is disseminated and stored on your private confidential account or sent over the wireless network. The data is cross referenced on a street level map for viewing. The positioning information provided is cross reference to the closest geographic address and displayed in residential /commercial address format.

The main disadvantage of the existing system is that the system provides only a broad layout of the geographical address, providing and does not provide street wise address. Speed of the vehicle and engine is no way controlled by the existing systems, thus exposing the vulnerability of a system that provides only tracking.

The existing system also uses GSM network to send information to user which will be less data rates and also costly.[2]

4. PROPOSED SYSTEM

Proposed system provides the relevant information regarding all the bus numbers going from users source & destination along with the route details, real time location. Generally the system is operated by GPS which is attached with the bus. Firstly GPS receives the satellite signals and then the position co-ordinates with latitude and longitude are determined by it. The location is determined with the help of GPS and transmission mechanism. After receiving the data the tracking data can be transmitted using Wife router. In this project ARM7 microcontroller is used to read gps and send to Wifi. Based on IoT the students/staffs can access this information of a bus based on users source and destination through the android application. Our proposed system also record the student entry and exit locations which will be shared to the students parents through internet. The block diagram of proposed system is as shown in the fig 4.1.

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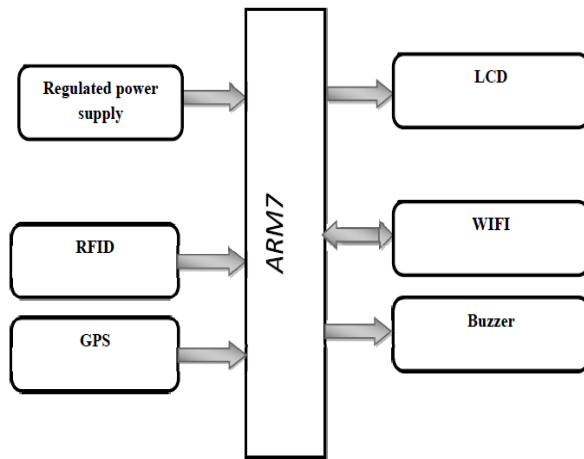www.ijiemr.org

Vehicle section

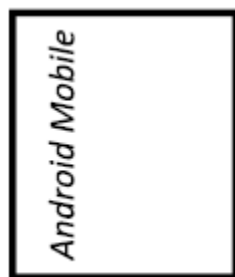Fig.4.1 Block diagram of Vehicle section

Fig.4.2 Block diagram of Monitoring section

5. SOFTWARE TOOLS

In this project the implementation is done by using different software's like:

- Keil µVision IDE
    - Editor
    - Compiler
    - Debugger
    - Converter
- Proteus
    - Schematic design
    - Simulation
    - Layout design
- Flash magic
    - Used for dumping purpose

6. RESULT ANALYSYS

The proposed system was fully developed and tested to demonstrate its feasibility and effectiveness. The proposed system is more user friendly than existing system. And it also gives greater performance. The screenshots of the smart home app developed has been presented in Figure bellow.
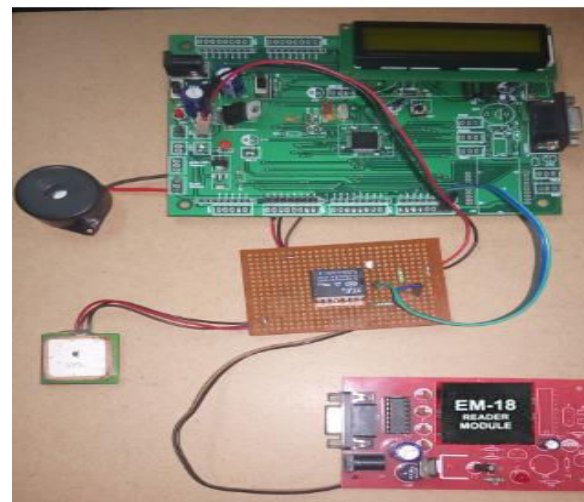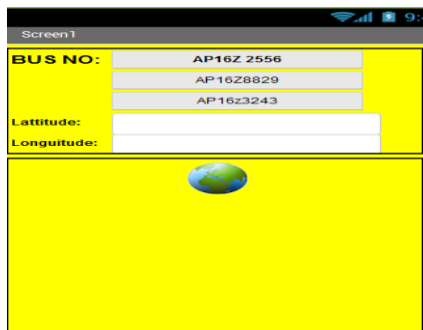

Fig 6.1 Screen shot of proposed system
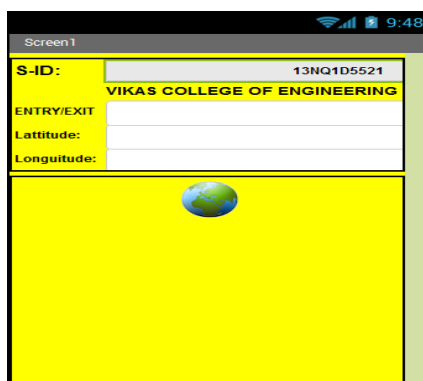
Fig 6.2 Android app screenshot for bus tracking

Fig 6.3 Android app screenshot for Student Entry and Exit

7. CONCLUSSION AND FUTURE SCOPE

The proposed system is successfully designed, implemented and tested and the following conclusions are made. Our system reduces the waiting time of remote users for bus. The system tracks the bus at any location at any time. And also provides the student bus entry and exit positions, All the current information is stored to the server and it is retrieved to remote users via web

based application. This system is more user friendly for users to get information visually shown on Google Map. User can freely get this web based application for real time tracking of bus which provide interactive interface environment. So by using this application remote user can just wait or they may reschedule their journey according to the availability of bus. . So this paper presents a system which provides high practical value in the modern fast era. The system has high practical value and cost efficient.

This project is having a wide scope. A web based application which can be further modified using cloud. Use of video camera to this system would take this system to the next level in the field of security. It will help to monitor the crimes that happen now a days which is witnessed by common people every day. This would prove a major breakthrough in reducing the crime rates. Also, with use of motion sensors the speed of the bus can be calculated.

8. REFERENCES

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