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COLLEGE BUSES AND STUDENTS MONITORING SYSTEM WITH IOT

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Abstract: The aim of the project is to develop a system to monitor pick-up/drop-off of students to enhance the safety of students during the daily transportation from and to school. Student's safety is of utmost importance to their parents. Despite of the best safety measures, students due to lack of skills to protect themselves, may end up in a situation that endangers their life.

This project develops a system to monitor the daily bus pick-up/drop-off of Students to enhance the overall safety of the daily bus transportation to/from school. The system aims at detecting when a Student boards or leaves the bus and issue an alert message to reduce the parent concerns about using the bus for the daily transport of their student without being lost or forgotten.

The system developed here sends the message to the parents along with the stop location, time at which student boarded into or exited from the bus. The data also gets updated into the web server. Web server even displays the data regarding the total number of students travelling in the bus, driver and bus information along with the fuel level at each and every stop, which can be accessed from anywhere by connecting to internet.

Keywords—*RFID system, Fuel sensor, GPRS,IOT.*

INTRODUCTION

Student safety is of utmost importance to their parents. Despite the best safety measures, student, due to their lack of skills to protect themselves, may end up in a situation that endangers their life

In this project, we focus on a particular risk associated with the daily bus trip to and from school. There have been previous incidents where a student is forgotten in the bus and eventually die because of suffocation. To improve transportation safety, some colleges employ a bus supervisor to look after the student inside the bus. Nonetheless, human oversight or supervisor absence may still lead to a heartbreaking ending as in the previously cited stories.

This project presents a system to monitor the daily bus pick-up/drop-off of student to enhance the overall safety of the daily bus transportation to/from school. The system aims at automatically detecting when a student boards or leaves the bus and issue an alert message when a student does not board or leave the bus to reduce the parents' concerns about using the

bus for the daily transport of their student without being lost or forgotten.

Design of Proposed Hardware System

In this proposed system consists of two parts one is 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, now when the student enters the school bus, before that he should scan his card, now as soon as he will scan the card a message will be send through GSM to his parents that their student has went to school along with time and location.

In second part of the system when the student will leave from school and before entering into bus he need to scan the card, after scanning the card a message will be send again through GSM to this parents. That their student has left from school and entered into the bus. Simultaneously data will be up loaded into the web server.

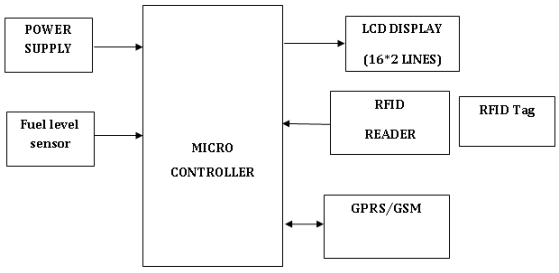


Fig 1: bus section

In this bus section we are having additionally fuel level sensor for measuring the fuel level of the bus and also we are counting the number of students in the bus and also driver information. This data will be up loaded into the web server.

Micro controller: This section forms the control unit of the whole project. This section basically consists of a Microcontroller with its associated circuitry like Crystal with capacitors, Reset circuitry, Pull up resistors (if needed) and so on. The Microcontroller forms the heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written

ARM7TDMI: ARM is the abbreviation of Advanced RISC Machines, it is the name of a class of processors, and is the name of a kind technology too. The RISC instruction set, and related decode mechanism are much simpler than those of Complex Instruction Set Computer (CISC) designs.

Liquid-crystal display (**LCD**) is a flat panel display, electronic visual display that uses the light modulation properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock.

BOARD HARDWARE FEATURES

GPRS:

GPRS (general packet radio service) is a packet-based data bearer service for wireless communication services that is delivered as a network overlay for GSM, CDMA and TDMA (ANSI-I36) networks. GPRS applies a packet radio principle to transfer user data packets in an efficient way between GSM mobile stations and external packet data networks. Packet switching is where data is split into packets that are transmitted separately and then reassembled at the receiving end. GPRS supports the world's leading packet-based Internet communication protocols, Internet protocol (IP) and X.25, a protocol that is used mainly in Europe. GPRS enables any existing IP or X.25 application to operate over a

GSM cellular connection. Cellular networks with GPRS capabilities are wireless extensions of the Internet and X.25 networks.

Fig 2: GPRS module

RFID:

Radio Frequency Identification (RFID) is a silicon chip-based transponder that communicates via radio waves. Radio Frequency Identification is a technology which uses tags as a component in an integrated supply chain solution set that will evolve over the next several years. RFID tags contain a chip which holds an electronic product code (EPC) number that points to additional data detailing the contents of the package. Readers identify the EPC numbers at a distance, without line-of-sight scanning or involving physical contact. Middleware can perform initial filtering on data from the readers. Applications are evolving to comply with shipping products to automatically processing transactions based on RFID technology RFID Reader Module, are also called as interrogators. They convert radio waves returned from the RFID tag into a form that can be passed on to Controllers, which can make use of it. RFID tags and readers have to be tuned to the same frequency in order to communicate. RFID systems use many different frequencies, but the most common and widely used & supported by our Reader is 125 KHz.

Fig 3: RFID Reader

Tags are classified into two types based on operating power supply fed to it.

1. Active Tags
2. Passive Tags

Active Tags: These tags have integrated batteries for powering the chip. Active Tags are powered by batteries and either have to be recharged, have their batteries replaced or be disposed of when the batteries fail.

Passive Tags: Passive tags are the tags that do not have batteries and have indefinite life expectancies.

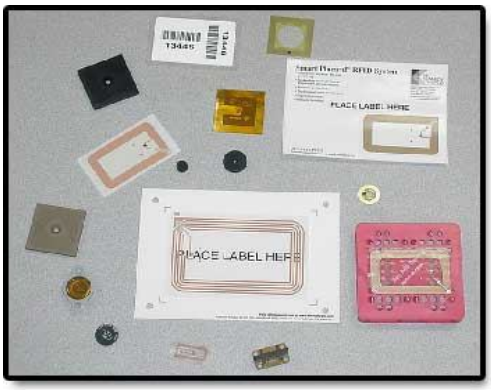


Fig 4: Different types of tags

FUEL LEVEL SENSOR

The fuel level sensor (sender) is located in the fuel tank usually integral to the fuel pump

module. Usually they cannot be replaced without replacing the fuel pump module, though there are exceptions. There is a wire attached to a strip that travels along a resistor which is grounded to the tank, frame or has a dedicated ground circuit. Voltage is supplied to the sender and the ground path changes according to fuel level.

RESULTS

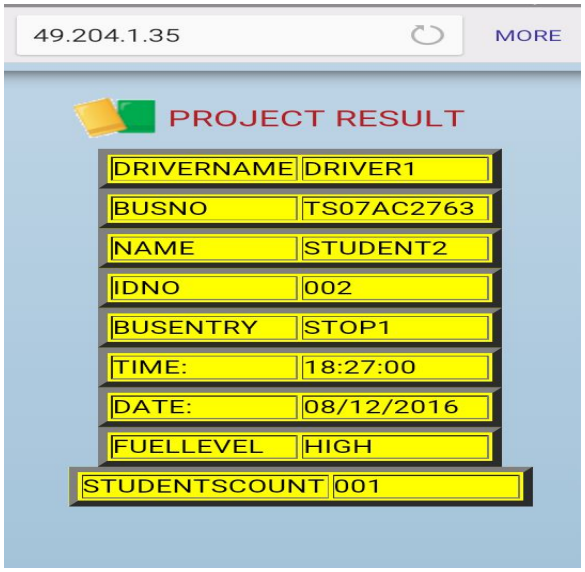


Fig 5: Showing the data on web server

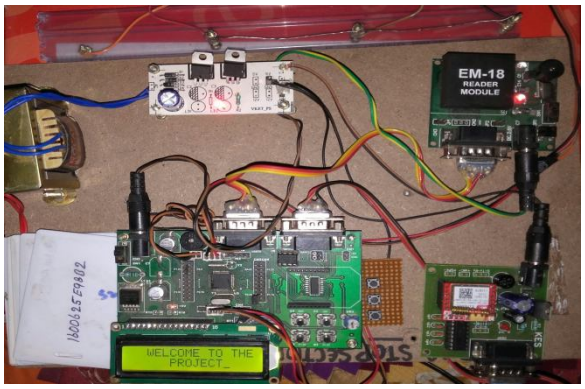


Fig 6: Hardware model of the project

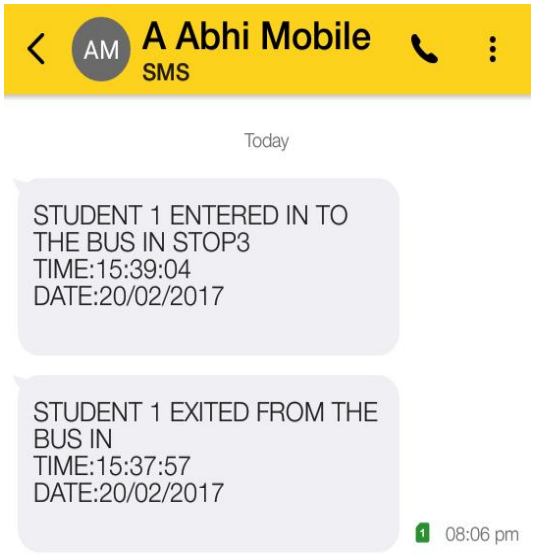
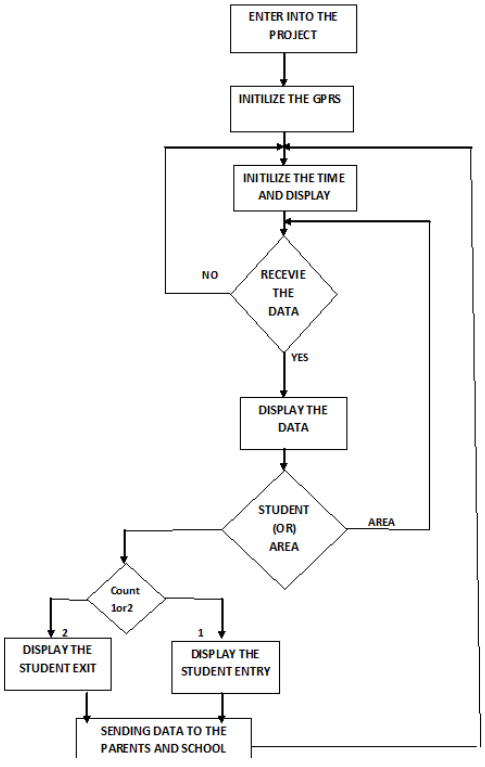


Fig 7: Message received on parents mobile

FLOWCHART



CONCLUSION

This paper presented an RFID-based system that aims at enhancing the safety of student during the daily

bus trip to and from the school. RFID-based detection unit located inside the bus detects the RFID tags worm by the student. It then sends, via a GPRS modem, the relevant data to the system database server. The system checks and detects which student did not board or leave the bus and issues an alert message to this effect. In addition, the system checks the student attendance and updates the database. The parents can log into system website and monitor the details of their student and bus information like number of students and fuel level of the bus. This will reduce the accidents of forgetting the students inside the bus.

FUTURE SCOPE OF WORK

This system can be further implemented using active RFID which can be detected easily by the RFID reader within a minimum range.

An Omni directional antenna can be used to detect the presence of the students in all directions, further in case if the driver attends phone calls during the motion of the bus an alert notification to the server can be provided.

This system can be extended for Hospital management for visitors, so as to decrease newly born child lost scenarios, which are seen at present.

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BIOGRAPHIES

Abhilash Kanakanti currently a PG scholar of Embedded Systems in ECE Department. He received B.TECH degree from JNTU. His current research interest includes Analysis & Design of Embedded System for modern life style.