SMART SYSTEM FOR COLLEGE BUS USING IOT

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ABSTRACT

The main aim of this paper is to identify the bus location and to identify whether the students have paid their fee or not and the number of students available inside the bus. College bus is used by the college students who are paying the fee. In some cases, the students who are not paying the fee also travel in the college bus. The SMS is send to the parent using GSM module if the fees is not paid. The RFID technology is used to check whether the student have paid the fee. The Wi-Fi module and GPS module is used to navigate the location of the bus that is where the bus is currently available. By scanning the RFID tag before entering ,the count of the students inside the bus is known and also the number of students using the particular bus can also be identified.

Keywords: *Cloud, Automation, IOT, GSM module, Wi-Fi module, GPS module.*

I. INTRODUCTION

The maintenance of college bus is essential for the college management since it includes the safety of the college students travelling in the college bus. The tracking of bus while reaching to college and returning from college is important to ensure the safety of the bus and the students. The bus tracking can be done by the Wi-Fi module and gets updated at every terminal. Then the location of the bus can be viewed by anyone within the management.

The RFID technology is being used in many applications for tracking and accessing. The payment of the bus fee is also need to be taken care by the management. The student is whether paid the fee or not can be identified by the RFID tags present in their ID cards. After scanning is done, they can be checked for whether they paid the college fee or not. In case of not paid, the message can be sent to their parents and the intimation is also sent to the driver.

The management also should know about the total number of students using the college bus. These can be identified by the number of RFID tags scanned before entering the college bus. By scanning the number of tags can be counted and displayed in the LCD and also updated in the database.

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II. EXISTING SYSTEM

The existing system includes the RFID system for ticket generation per head in public transport. The RFID tags are need to provide to every individual passengers. The system is used to avoid the ticketless travel. Since at times there may be the possibility of cheating by doing ticketless travelling. This can be avoided by this method. The two way authentication helps in preventing the fool proof ticketing. In this system every individual using the bus must contain the RFID tag with them, even when they are come as family. The current locations of the buses are not known in the existing system.

III. PROPOSED SYSTEM

This system helps in tracking the college bus where it is available and also finding the number of students using the college bus. This helps in providing the safety to the college bus students and also helps the college management to know about the college bus details at any time, at anywhere. The student is whether paid their college fee or not can also be checked by our proposed system. This helps in finding out the unauthorized users of the college bus. The tracking of college bus is essentially needed for student's safety. Finding the students paid their college bus fee helps for the college bus maintenance system. The total number of students inside the college bus can be updated.
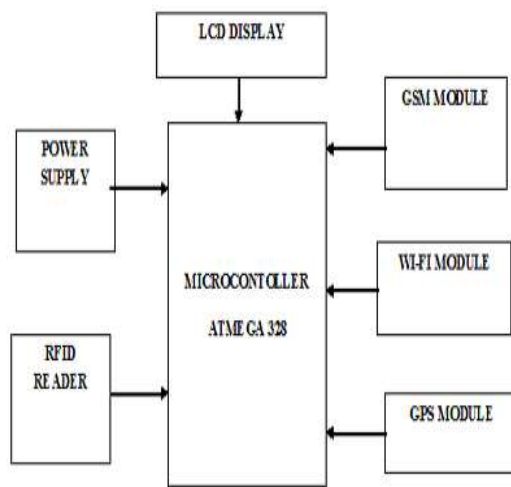

Figure 1.Block diagram

The block diagram shows the model of the proposed system. The microcontroller is the main component in this system. The microcontroller will be in the off state and it will be turned on when the bus arrives the stopping. The student scans the ID card in the reader before entering the bus. The data is displayed in the LCD display and message is sent through the GSM module. By scanning the cards before entering the bus the number students inside the bus can be counted and updated in the database. Once the device is in active mode the Wi-Fi module in the bus gets connected. The live location can be tracked by the GPS and the mobile application.

IV.   HARDWARE DESCRIPTION

4.1.RFID TAG

Radio frequency identification is used to track and access the objects attached to it. The RFID tag has the identification number or the barcode reader printed on the tag. It works in electromagnetic field and consists of the transmitter and the receiver. Here the RFID tag is nothing but students ID card. The chip is present inside the tag. The chip consists of the student's information. The information like name, department, year, address etc.

Figure 2.RFID tag

4.2.RFID READER

An RFID reader is used to scan the RFID tag. Once the tag is scanned in the RFID reader, the reader sends the signal to the receiver of the tag. The information present in the tag and the information from the database are sent to the reader. The information can be transferred by this process. The RFID reader is small in size and can be placed easily in wall, doors or in other places.

Figure 3.RFID reader

4.3.LCD DISPLAY

A liquid crystal display is used to display the information. When the student shows the card to the reader, the tag is scanned and checked whether the student have paid the fee or not. This detail can be updated from the database. Thus once the card is scanned the fee detail is displayed that is paid or not paid.

Figure 4.LCD display

4.4.MICRO CONTROLLER

The ATMEGA328 microcontroller is used. The microcontroller is the main component because it is used to control all the functions in this system. It is an 8 bit microcontroller of 32k flash memory. The main purpose of ATMEGA328 microcontroller is, it can be used with Ardunio Duemilanove boards. All the components are connected to the microcontroller and their functions are controlled by the microcontroller.

Figure 5.Microcontroller ATMEGA 328

V.   SOFTWARE DESCRIPTION

5.1.ARDUINO IDE

The software used in this paper is Arduino IDE, the writing and compiling of the code is easy and it is open source software. The embedded C code is used in this system. This is to program the RFID card i.e student ID card which contains the student profile along with the fee details. This provides the authentication for the students to enter into the bus.
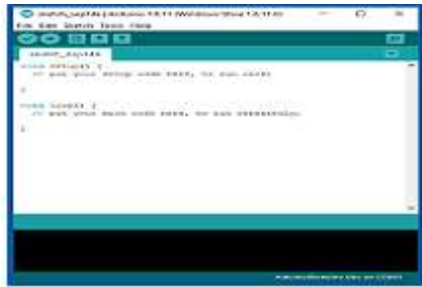
Figure 6.Arduino IDE
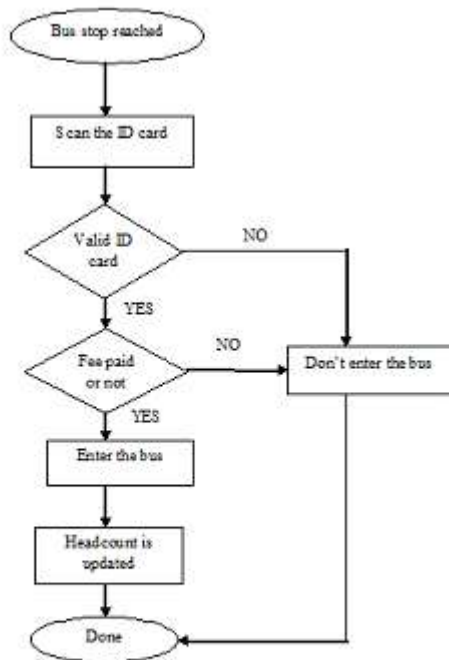
VI. FLOW DIAGRAM

Figure 7.Flow diagram

The flow diagram shows the process of the proposed system. When the bus has reached the stop ,the students scans the ID card in the reader. If the card is valid, the fee detail is checked from the database and displayed in the LCD board. The student enters the bus and the students count is updated once the card is scanned. If the card is invalid or the student did not paid the fee, they are not allowed to enter the bus. Thus the process is done.
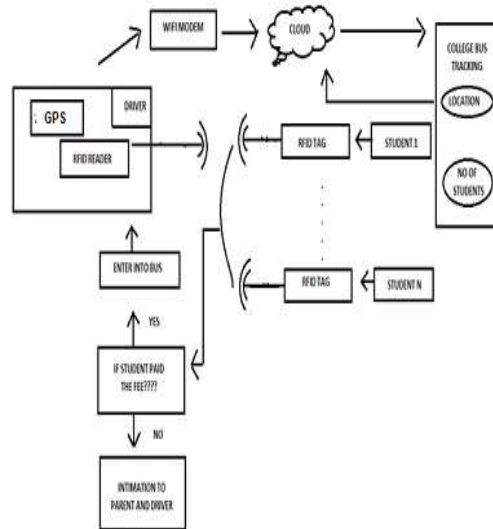
VII. ARCHITECTURE DIAGRAM

Figure 8.Architecture diagram

First, the student fee details can be checked by providing the RFID tags given to the individual students, the RFID tag is nothing but students ID card. The RFID reader is placed in every bus. By scanning the tags, the students can get into the bus. The fee detail is displayed in the LCD. If the students did not paid the fee , the message not paid is displayed. The driver can get the intimation about the student and also the message is sent to the parents. By scanning the card before entering the bus , the number of cards scanned can be counted and updated in the database. The total number of students present inside the bus is known.

And finally, the tracking of college bus. The Wi-Fi module and the router is placed inside the bus. When the bus reaches the stopping the Wi-Fi module gets connected to the router at some access point. The location of the bus is updated in the cloud and the data can be retrieved from the database. The current location of the bus can be tracked by using the mobile application.

VIII. CONCLUSION

This system is useful for the students using the college bus and also the college management. The management work has been reduced in this system. The safety of the student is ensured, whether the student has come to the college or not.

The parent also can track the live location of the bus. This helps to save the time for students and also the faculty uses the college bus. It helps them to have a easy and tension less mornings, mainly during exam times.

IX. RESULT AND DISCUSSION

The designing, testing and implementation of the system are done. This system helps the college management to track the current location of the bus at any time and all the information can be viewed at the webpage. In future this system can be modified according to the user need. The camera can be used in the system for the security purpose. The motion sensor can be used and the speed of the bus can be controlled which reduces the accident rate. Depending upon the requirement of the user the further development can be done in future.

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