

# Passenger Tracker for School and College Bus

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## ABSTRACT

Many students in school and colleges are using the bus facilities provided by the institutions by paying some fee for their usage, based on their boarding place. The institution provides a separate bus pass for each user, once they register their name. The students are permitted to travel in a particular bus allocated for their route, but nowadays students are travelling in all buses and even students, who are not regular bus users, are also travelling in institution buses. This leads to problem of insufficient number of seats. To avoid this problem the drivers need to check regularly. This project involves Raspberry pi 2 controller, RFID Reader Module, LCD Display, and python as the programming language. PTSCB (Passenger Tracker for School and College Bus) is deployed in all institution buses to check and alert on the non bus user and also add the fine amount to the invalid bus users.

**Keywords :** Raspberry Pi 2 controller, RFID Reader, LCD Display, Python

## I. INTRODUCTION

Technology is upgrading day by day, to reduce the manual work. But still some works are being handled by the human beings like the driver. He has to check the bus pass in the institution's transportation. If more number of non bus users uses the transport facility, it will affect the regular bus users by inadequate seats in the bus. Every day the driver is not able to check valid bus users and also it results in wastage of time. In case the regular driver is on leave then alternate driver will come. Regular bus users are not familiar to the driver, so invalid user may use the bus. To overcome these problems we go for this project Passenger Tracker for School and College Bus (PTSCB). The institution provide the RFID Card to students it consists of student detail which includes whether they use institution's transportation or not. This Passenger Tracker tracks the invalid bus user. The details are stored in the text file. We use RFID Module to read the card. Once the card read it is compared with stored details. If the card is matched count is calculated, if the count exceeds two, the fine amount is added to the respective user. If the card is not matched the fine amount is added to the invalid user. In some cases the user may not show his ID to the reader module, in that case IR sensor is used

to find the number of members entering the bus. If the count of IR sensor and the reader module is same, it shows that all the users had shown their ID to the reader module and vice versa. At last LCD, displays is used to indicate the matched and unmatched cards. Buzzer is also used to find the valid user by the different sounds.

## II. METHODS AND MATERIAL

### A. Literature Survey

The priority based on time and efficiency. Many technologies are being introduced, in that smart card emerges as one of the converging technologies. Smart access using smart card in toll gate control, and in bus ticketing system. RFID place major role in auto ID applications like RFID contactless smart cards. This system is done in the domain of automation for passenger identification and toll collection, so this is used in public transport system. This is a user friendly system, which detect the fare automatically. The cards which are used in this system is reusable, it is more convenient compared to the paper based ticketing system. RFID cards are distributed among the public. The account is created for each member and it contains

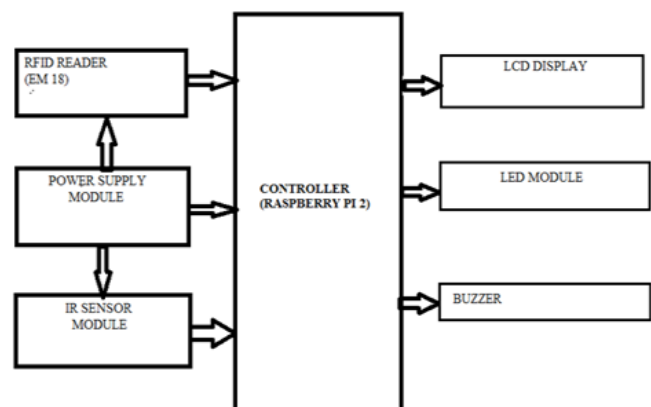
all the details of the respective member which includes unique ID, this account is accessed using internet by accessing this database, it is possible to identify the person. The fare is taken from individuals account. This reduces human mistakes and efforts. The RFID reader type is EM 18. Raspberry pi I is used as a control unit and programming is done using python language [1]. In day to day life we are running short of time and we don't have enough patient to wait for the bus. Because of traffic congestion, delay due to accidents, irregular vehicle dispatching times, and other incidents such certain results in passengers to wait for their bus to arrive at the bus stop. A new system based on RFID, in which each commuter's having a smart card fitted with a RFID tag along with unique ID. The RFID reader is used to scan the card in entrance and at exit area. The fare is detected depends on the distance travelled by the commuter. The additional feature is the passenger can track the position of their desired bus in real time through an Android app, and also get an occupancy estimate of the respective bus. It enhances the customer convenience and eliminates the use of paper tickets in transport systems [2]. Bus pass is provided for regular bus user to make frequent intercity travel trips. This make a profitable cost as compare to daily bus fares in existing system, bus pass registration and authentication is done manual with no use of computer so the user details are not saved. It is very mandatory that the information like user details, documents verification details, records of user's travelling details should be stored at some secure location. Then only we can verify further when ever required. This system involves design, development and building smart card authentication for bus passenger. The reader reads the user details from RFID tag and check the details with the database .The authenticated users only allowed to use the bus pass, otherwise it shows an error that card is invalid. And also the Android application is developed to help users in making better travelling decisions independently by providing time table of all bus routes in the city [3]. People are using the public transport vehicles for transportation. The Overloading of bus is the main factor which affects the safety and comfort of the passenger. It is impossible to avoid overloading in the buses. The passengers in the bus stops can definitely come to know about the crowd inside the bus for that we need a passenger counting mechanism. Also, the passenger counting will help to improve he vehicle efficiency, fuel economy and the passenger comfort

[4]. Metropolitan cities like Mumbai, Kolkata have severe security problem in public transport. The problems includes.

- i. The passengers have more confusion regarding fares which lead to corruption.
- ii. Because of mismanagement the public transport passengers faces the problem of traffic jam,
- iii. The security is very less in public transport due to anti social elements.

The user friendly automated ticketing system detects the passenger fare depending on the distance travelled and also detects the passenger identification. This is done only by use of RFID tickets and GPS. This can be used to make the transaction and travelling very precise. It is also deals with the identification and ticketing of the passengers in the bus [5].

## B. Proposed Passenger Tracker for School and College Bus



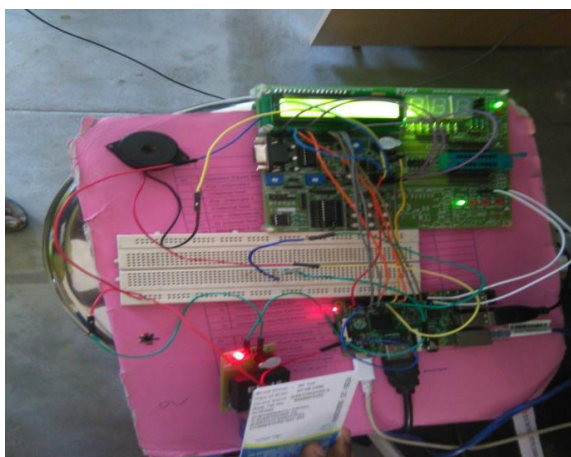
**Figure 1.** Blockdiagram of passenger tracker for school and college bus

Passenger tracker for school and college bus is used to find the invalid user. Some of the students are using the institution's transport facility for that they pay a particular amount of fee to the institution, but some others are not paying any fee but are using the transport facility of the institution. Because of this there may be a chance to have inadequate number of seats, to overcome this problem we propose this paper. This contains the hardware's as RFID Reader, power supply module, IR Sensor, LCD Display, LED, Buzzer. The RFID Reader module is used to read the RFID card which is shown by the respective user. We already stored the details of the valid bus user and it will check whether the card is matched or not with the stored

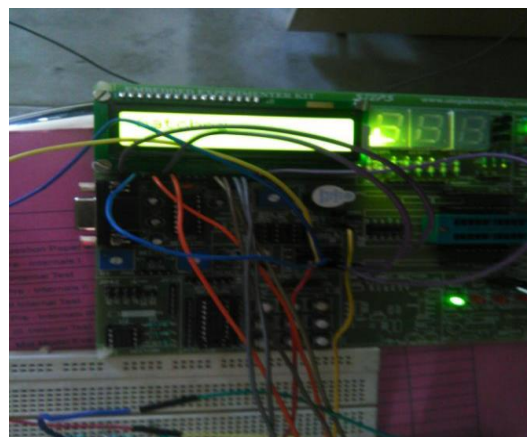
details. The reader module used in this is EM 18 Module, which is used to read the all type of RFID cards .The IR sensor is used to count the number of members entered in the bus and the value is stored. Power supply module is used to give the necessary power to all the hardware parts. The controller used in this project is raspberry pi 2 model, this controller acts like a CPU, the RASBIAN is the OS (Operating System) for this controller. This controller will control the all the hardware's. The Buzzer is used to find the valid and invalid bus user by providing different sounds with different time delay. Along with the buzzer LED (Light Emitting Diode) is also used to check the authenticate user, green LED indicates the authenticate user, red LED indicates means the non-authenticate user. The LCD Display is used to display the matched and not-matched cards.

### III.RESULTS AND DISCUSSION

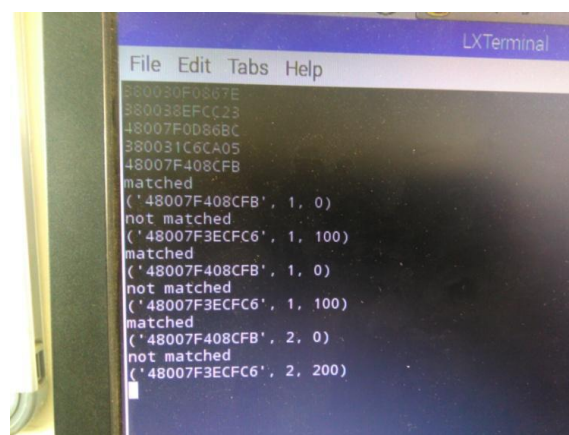
The whole setup is controlled by the micro controller (raspberry pi 2), and the respective user use his/her ID card twice a day. So, malpractice is avoided and it will increase the security .This passenger tracker is very useful for all schools and colleges. It will reduce the manual work, and easy identification of invalid user.



**Figure 2.** Hardware setup of PTSCB



**Figure 3.** LCD Display setup



**Figure 4.** Output window

### IV.CONCLUSION

PTSCB system is low cost product, so it can be used in all institutions. And it alerts on invalid users. By deploying this PTSCB the number of invalid users get reduced in an efficient way. Using LCD display helps in better identification of the users. PTSCB also increases the security level. Now a days some of the companies are also having their own buses for their employees. The government transportations may also use this passenger tracker because some intercity travelling more number of people use the bus pass so this system is applied in this type of government buses.

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