

## RFID Based Ticket Collecting System

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### ABSTRACT

*This paper presents an automated system for ticketing in the Public Transport System (PTS) which is based on passenger identification. This is a user friendly system, which will automatically identify the passenger and deduct the passenger's fare according to the path travelled. The Radio Frequency Identification (RFID) cards are used to make the identification of passenger and transaction very precise. The cards being reusable, they are much more convenient compared to the paper based ticketing system. RFID cards are distributed among the public. The unique ID in the RFID cards are stored in a database in the internet along with personal data and creates accounts for each person. By accessing this database, it is thus possible to identify the traveller, check his account and deduct the fare from his/her account. Creating database facilitates efficient filtering of anti-social elements and gives firm assurance to both passenger and PTS about the transaction. Fare calculation is done with the help of switches. So a change in fare does not create any confusion as fare calculation is done by evaluating paths by switches and. The system thus reduces human errors and efforts. The RFID reader used is E18.*

*Minicomputer Raspberry Pi is used as control unit and programming is done using Python. GSM module is used for the purpose of indication about amount deduction. LCD & Buzzer are used for monitoring.*

### INTRODUCTION

PTS remains the major source of income in most of the developing countries like India. But PTS now faces severe malfunction and various security problems. First,

there is a lot of confusion between the passengers regarding fares which lead to quarrels and corruption. In addition to this, nowadays there is a severe security crisis in PTS due to antisocial elements. The user friendly automated ticketing system suggested in this prototype model will not only automatically deduct the passenger's fare according to the paths covered but also detect the passenger's identification.

This is possible by use of RFID cards and switches, and can be used to make the transaction and travelling very precise. This paper basically deals with the identification and ticketing of the passengers travelling by the bus.

Also discusses possible future extensions of this system in areas such as Internet-of-Things (IoT). The idea of using RFID in PTS was previously put forward by different personalities [1-6]. But the system proposed here stays closer to a future ticketing system than anything else. Usage of Raspberry Pi is another important feature owing to possibilities of future expansions and alternations. With the advent of new systems to replace Pi, smaller and more reliable systems are expected to come into existence. RFID has been an emerging technology in recent years. RFID technology can be effectively employed in number of applications due to its penchant for efficiency. As for its application, it's been a widespread tool for both tracking the transit transports. A fundamental system of RFID consists of two primary components: The reader circuit and tag, details of which are discussed later. The usage of RFID has a great advantage as it is considered to be an integral part of IoT. IoT refers to a global network infrastructure, linking physical and virtual objects through exploitation

of data capture and communication capabilities [7]. Identification of objects is a huge task ahead of IoT and usage of RFID in PTS can be considered a step towards implementing IoT[10]. The proposed system mainly acts to bring out the consistency among various bus agencies that will conclude in uniform access of passengers in daily rides through an automated server being updated every single time the passengers travel by carrying the RFID based tickets.

After going through these papers, we got the idea to do a project on RFID based Bus Ticketing System. The idea was to create a system capable of mass identification process, precise location data recorder and easier and faster contactless payment.

## PROBLEM STATEMENT

PTS now faces severe malfunction and various security problems. First, there is a lot of confusion between the passengers regarding fares which lead to quarrels and corruption. In addition to this, nowadays there is a severe security crisis in PTS due to antisocial elements.

## EXISTING SYSTEM

In the general way, every bus is controlled by a conductor. The conductor will collect money from each passenger and issue ticket. Initially, printed papers or tokens are used as tickets. Nowadays, handheld machines are used to print tickets. This system has many disadvantages. The passenger has to carry the ticket till the end of travel, the conductor should ensure that everyone has got the ticket, [3] the time taken for ticketing is comparatively more and more amount of paper is needed to print the ticket. Nowadays conductors are trained to operate the handheld ticketing machine. For example, if a passenger wishes to travel in bus. He has to carry money with him. Then the conductor will collect the money and he will give ticket. This has to repeat for all passengers. This will take more time and waste of human resource as well as energy. Even handheld ticketing machine is comparatively slow and needs a trained person to operate it.

## PROPOSED SYSTEM

Here we are going to use this SWITCHES to calculate the distance travelled by the passenger. The position of the bus can be monitored continuously on LCD module. Smart cards can provide identification, authentication, data storage and application processing. These smart cards can be used as passenger identifications. Every passenger carries a smart card. The smart card has the information such as user identification number, available balance and status register. These smart cards should be capable of recharging, so that the passenger can use it again and again. Combining switches and smart cards we can design a complete bus ticketing system. A minicomputer Raspberry Pi is used to control the entire system. Switches and smart card reader are interfaced with the Raspberry Pi. It can be further connected with liquid crystal display and keyboard for user interface. Every time when the passenger enters the bus he needs to swipe his smart card in the smart card reader. On calculating the bus fare the equivalent amount is reduced by the user & balance deduction message sent through GSM.

## LITERATURE SURVEY

### 1) Embedded System Based Automatic Ticket Vending Machine for Modern Transport System

**Author: Bhuvaneshwari<sup>1</sup>, S.Sukhumar<sup>2</sup>, N.Divya<sup>3</sup>, S.Kalpanadevi<sup>4</sup>, N.Suthanthira Vanitha**

This research paper is based on the concept of automatic ticket vending machine by using RFID and Zigbee technique. In order to ensure the passenger's journey with no quarrels and mess we employ this ticket friend solution that replaces the traditional paper ticketing by RFID tickets and vouchers, vended through automated machine using smart cards, which improves the convenience and security of transaction. Ticket friend solution through automated machine enables the passenger to predetermine the transport details. In this automated system we replace the traditional ticket system by smart card that contains all details of the user including bank account information, which is similar to the ATM card. This automatic ticket vending machine consists of display which shows the availability of buses

for all destinations. The person can find out the destination place by pressing the buttons available on that machine with the help of zigbee. If the location is selected then the availability of buses along with the time is displayed. If the people confirm to go in certain bus, by using smart card the person can receive the tickets employing RFID technique and by showing the ticket in front of the bus the door opens automatically and after some predetermined seconds it gets closed. If the person is supposed to consume alcohol that is detected with the help of alcohol sensor and that person is not permitted inside the bus. Voice GPS is placed inside the bus and the display shows the route map. For that PIC microcontroller is already pre-programmed to do the operations. By using this we can minimize manpower in buses and ticket counters, predetermining of the bus can be done to find the destination exactly, safe journey can be assured without any disturbance and systembased booking for easy usage. Voice talking GPS proposed in the transport make the passenger to identify their departing location

**2) Conductor less Bus Ticketing System Using RFID and Accident Information through GPS and GSM**

**Autor:-PT.Manikandan, PG.Kalaiyarasi, PK.Priyadharshini, PR.Priyanga**

The objective of this project is to count the passenger using IR sensor and calculating the distance travelled by passenger automatically using motor and u-slot sensor, and the corresponding amount is debited from RFID card. In addition to that, in proposal system the occurrence of accident information is automatically transmitted to the nearest hospital using GSM and GPS. In IR transmitter and receiver, IR transmitter is nothing but one type of LED, generally called IR transmitter. Initially IR transmitter and receiver are placed straight to each other, so the transmitted IR ray are received by IR receiver. But when passenger crosses the IR transmitter and receiver, the rays received will be interrupted. Here the micro controller used is Atmel 89C52, is flash type reprogrammable memory in which we have already programmed. So, signals received from SCU and increment the count value. Here RFID tag is

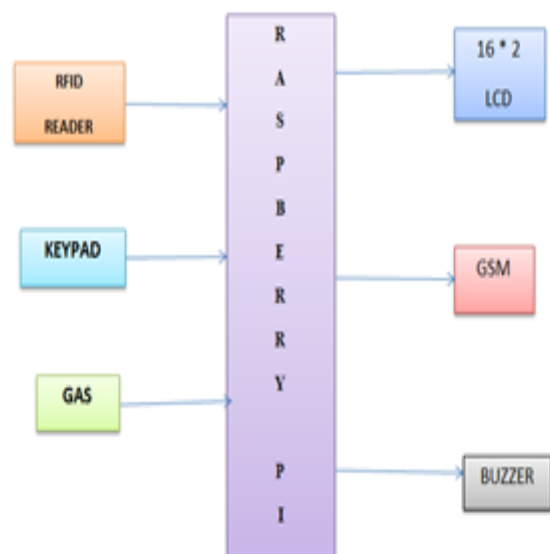
rechargeable one, where as it can be recharged in bus depot or nearest retail shop. Micro controlled, keypad and LCD are provided in bus depot for recharging purpose by own.

**3)GPS based Automated Public Transport Fare Collection Systems Based on Distance Travelled by Passenger Using Smart Card**

**Author;Arun Das .S .V, K. Lingeswaran**

The aim of this paper is to provide a comfort tension free and easy way of travelling and also to reduce the man power. This paper involves the combined usage of smart cards and GPS to make travelling smarter. In our paper, Smart card which has become a common thing now, holds the data of the card holders and GPS which is an efficient tool in many fields like surveillance and tracking, which is used in here to find the distance travelled by the user. The smart card can be used by the user for entering and leaving the bus. Depending on the distance travelled, the money which has been paid in advance will be deducted from the card. This paper includes implementation of the Microcontroller which controls the entire system. It works effectively with GPS and smartcard. This study also stresses the need to make this system practical and the result that we will obtain is explained in this paper.

**BLOCK DIAGRAM**



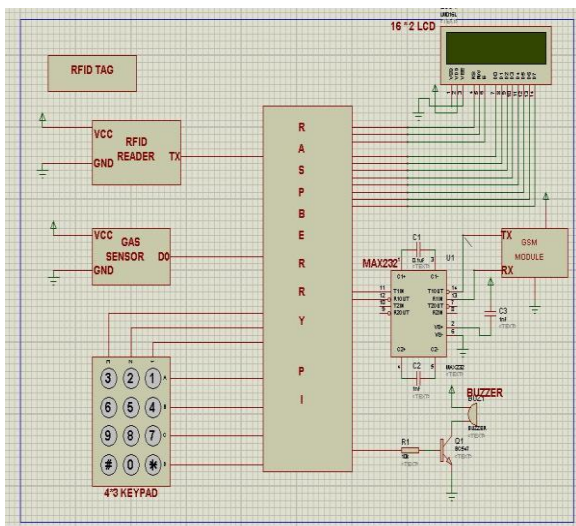
## BLOCK DISCRPTION

1. In this project we fix one path like MANAPA to katraj
2. When user enters in bus from that location to destination two switch press & ticket bill show on LCD.

Then RFID get activated

3. If valid user then balance deducted from account & message will send to user.
4. If invalid users then LCD shows invalid user transaction gets cancel, buzzer will beep.
5. If gas detected then buzzer beep & LCD show gas detected.

## CIRCUIT DIAGRAM



## SOFTWARE REQUIREMENT

- PYTHON LANGAUGE
- LINUX O.S
- Win32 Disk imager
- OpenCV

## ADVANTAGES

- An RFID smart card-based fare collection system may reduce operation costs in the long run.
- Public transportation authorities will be able to monitor ridership in real-time and will minimize delays by committing extra resources (buses or trains) to specific congested routes.

- RFID does not require line of sight. The reader can communicate with the tag via radio waves. An individual can potentially be identified and charged the right fare by simply carrying the RFID smart-card in his/her pocket.
- RFID equipment damage occurs much less frequently than is the case with magnetic strips or bar codes present on CharlieTickets.
- The combination of all above mentioned advantages will result in improved convenience and boost public transportation ridership.

## APPLICATIONS

System can be implemented in following:

- 1) BUS
- 2) Railway
- 3) Travels

## CONCLUSION & FUTURE SCOPE

The system is expected to be fully automated, reliable, transparent and convenient. The whole system can also be used in vehicle on highways, their toll payment and in the railway ticketing system with small or no modification. The cards being reusable, they are much more convenient compared to the paper based ticketing system. The card also can be used to be a universal travel pass card that will allow any transportation on any route. Any unwanted events can be avoided as all the person carrying RFID tickets are monitored every time they travel. Also the possibilities of reducing traffic jams, chaos in the bus stoppage that we usually experienced in Dhaka city are immense.

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