RFID Based Bus Ticket Generation System

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***Abstract*—There is a rigorous malfunction of public transport system along with different security issues in urban as well as rural areas of our country. Right off the bat, there is a great deal of confusion among the passengers regarding fares which lead to corruption. Issues of authorizing the passenger with a current ticket and lose money requirement for small travel fare from both customer as well as person doing public transport ticket generation. Thirdly this paper discusses RFID based ticketing and passenger identification in the public transport. That deals with identification, bus ticket generation and bus ticket checking using IOT. Proposed ticketing system is used to authorize the passenger travelling and solve the security as well as general issues related to carrying cash with users as using this proposed system passengers do not have to carry money with them. All the record of transaction will be updated automatically. Moreover, the doors of bus will be opened only when passengers had generated their ticket.**

Keywords—IOT, RFID, ARDUINO, WIFI MODULO, SERVOMOTOR.

I. INTRODUCTION

Now days the public transport system needs to be smart. In any case, public vehicle transports in India have consistently been a region where such new advances have turned their countenances out. Passengers convenience needs to improves the performance of existing public transport is driving, demand for intelligent system in market. Also there are no methods to authenticate a passenger travelling in the bus. Automatic fare collection system is currently being used in many urban cities around the world. In addition, this system integrates ticketing system inside the public transport only. This project is implemented fully on IOT. Today in world of IOT we are going to decrease use of paper and will use smart technology for bus fare system. This project shows the beauty of IOT. It defines how IOT can be used effectively to generate the ticket automatically. It eases the pressure on passenger of buying a ticket in rush to travel in local buses. The venture additionally shows that how we can guarantee that a traveler with substantial ticket must be permitted to go in a transport. The undertaking is carried out utilizing RFID card and Arduino and servomotors. The framework utilizes Arduino microcontroller, as it is a lot of advance so specific applications, for example, programmed opening and shutting of entryways on premise of RFID cards can be effortlessly carried out this paper shows how RFID cards can be used to generate bus ticket. Also with the help of this RFID cards a passenger can be authenticated, leading to an effective step toward security of passengers. In this system passenger will carry RFID cards which will be scanned at respective bus and asked for destination. Passenger will choose their destination and automatically respected amount will be deducted from their respective account and their ticket will be generated. As, the ticket will be generated doors of the bus will be opened for 30 seconds for passenger to enter in bus.

II. PROBLEM IDENTIFICATION

In present system ticket is issued by conductor. In present system handheld machines are used to print tickets. This system has also many disadvantages such as passengers have to carry their ticket until they reach their destination. Moreover, sometimes conductor charges extra money from the passengers who are unknown to the fares. Also sometimes passengers misuse this system by not buying tickets and travelling for free in bus. This ticket system also shows the wastage of papers as in a day about millions of paper tickets is generated. Sometimes cash issues occur in this kind of system. In this system there is no way of authorizing the passenger who are travelling in buses. Also while travelling in local bus there is lot of rush of tickets which create problems for passengers. Moreover, there is lot of confusion between the passengers regarding fares which lead to corruption. This system will give solution to above problems. RFID cards will be connected with Aadhar card in this way approving traveler along these lines guaranteeing the security of travelers going in the transport. Additionally, this framework will be incorporated in the transport; the traveler just needs to filter their cards to produce a ticket which require some investment contrasting with present framework forestalling the surge of purchasing a ticket. Entryways of the transport will be opened just when travelers had created a ticket guaranteeing that there is no such case wherein traveler travels in a transport without ticket.

III. LITERATURE SURVEY

Literature review was carried out throughout whole project to gain knowledge and skills needed to make this project. In paper [1] the authors explained the advantages of RFID cards about its low cost, it also explains how a RFID Reader will be there in the bus which is connected wo main server which is used for automatic fare collection. In paper [2] the fare is automatically deducted according to distance travelled using GPS in the system. A database is created which is used to hold unique RFID Card number issued to a passenger. In paper [3] passengers count is done with the help of IR sensors

and distance is calculated using motor and u slot sensor. After calculating distance, the amount is deducted from passengers account. It is also accompanied with the system that if any accident is occurred then nearest hospital get automatically notified to it using GSM and GPS. In paper [4] RFID cards and reader is used to read card number which is send to database using WIFI and a fair amount is deducted from person's account. Other sources are books, online tutorials which are being used to gain knowledge throughout the project.

IV. PROPOSED SYSTEM

The proposed system consists of 3 parts:

1. Issuing RFID Cards.
2. Ticket generation using RFID Cards.
3. Ticket Checking.

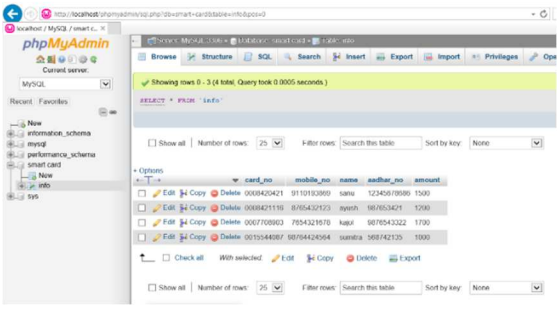
A. Issuing RFID Cards

RFID cards can be issued to passenger at counters of bus stand by filling a registration form. The counter manager has a website on which he will fill the registration form with all details of passenger and issue them a RFID card with unique tag on it.

- *Software Description*

  a. ***WEBSITE*** **-** A website is made from where passengers will register themselves and can issue RFID cards. Website is made with the help of HTML (HYPER TEXT MARKUP LANGUAGE) and PHP. PHP is Hypertext Preprocessor (PHP) is used to create dynamic web pages that connects with database. It consists MySQL connect function which is used to connect database with web pages. PHP is used to send all the data filled in Registration form of passenger to database to store this information.

  b. ***DATABASE*** - A database is made on to store passenger's details. It consists of all details fetched from website. Attribute named as Aadhar no is used to authenticate the person thus no unauthorized person will be permitted to travel in bus ensuring the security of passengers travelling in the bus.



B. Ticket Generation using RFID Card

This system works upon RFID cards system. After a passenger had issued a RFID card. He or She only had to scan this card under RFID Reader attached at the entry of bus. The RFID Reader will read data and send it to web server through WIFI modulo. The web server will authenticate the passenger. If passenger is authenticated, then the passenger is asked to choose his/her destination. According to the chosen destination the bus fare will be deducted from passenger account. If passenger do not have sufficient balance, then a message "Insufficient balance" will be shown to passengers. This system will ensure that there is no unfair means in ticket generation such as bus conductor demanding more money than the actual bus fare for particular destination.

- *Hardware Description*

  a. ***RFID CARDS AND READER*** **-** RFID reader is used to read RFID tags which are embedded with RFID cards Radio frequency identification (RFID) uses electromagnetic to automatically identify and track tags attached to the objects. RFID cards (card number) contain electronically stored information. RFID reader to read the information encoded on a tag consist a two-way radio transmitter-receiver which emits a signal to the tag using antenna. The tag responds with the information written in its memory bank.

RFID Cards

RFID Reader

b. ***ARDUINO*** **-** It is a microcontroller based upon ATmega328P.It act as a heart of all kinds of IOT projects. Even in this system it is the heart of system. It consists of 14 input/output pins,6 analog pins, a 16 MHZ (Mega Hertz) quartz crystal. Pin no 0(Rx) and Pin no 1(Tx) of Arduino is for communication. It consists a USB connection through which code is uploaded on it and a power jack to supply power to it. Arduino has its own compiler to upload code on Arduino. The name of compiler is "Arduino IDE".

Arduino UNO

c. ***LCD*** **-** Liquid Crystal Diode (LCD) of 16*2 size is used to display all the information to passengers. In other words, it acts as a user interface.


LCD

d. ***KEYPAD*** **-** A 4*4 Keypad will be use by passengers to select the destination displayed on LCD.

Keypad

e. ***WIFI Modulo*** **-** The ESP8266 is integrated with TCP/IP protocols which is used to send and receive data to or from computer. RFID reader reads data and send it to database for authentication with the help of this MODULO only.

Wi-Fi Modulo

C. Ticket Checking

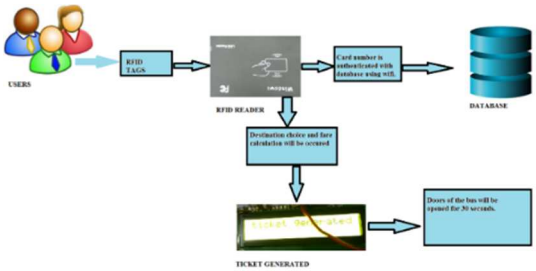
The proposed system to check tickets are automatic opening and closing of doors. The proposed system says that after generation of ticket by the RFID cards doors of bus will be opened for 230 seconds in which the person must enter in the bus. The gates of bus will be opened only if a valid ticket is generated otherwise doors of the bus will remain closed. This can be approached using servomotors.

1. Hardware Description

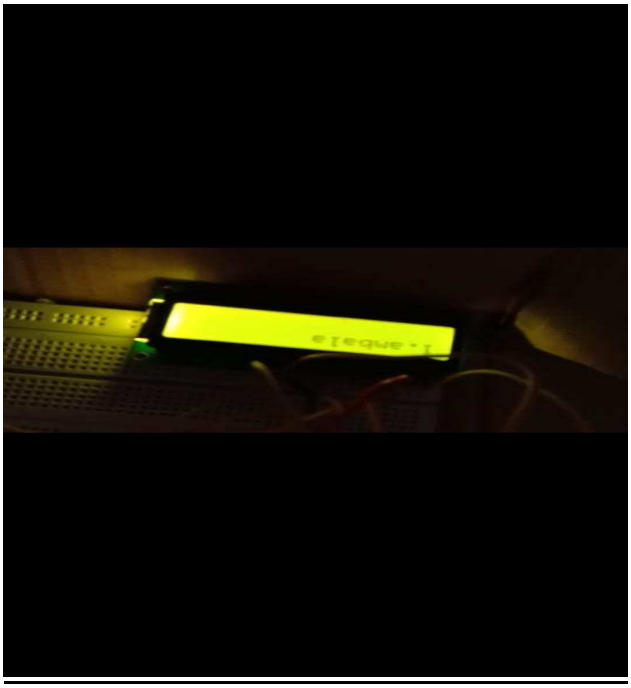
SERVOMOTOR **-** Servomotor Sg90 model is used. It can rotate from 0 degree to 180 degrees. It consists Torque power of 2.5kg/cm. Operating speed of this servomotor is 0.1 second per 60 degrees.

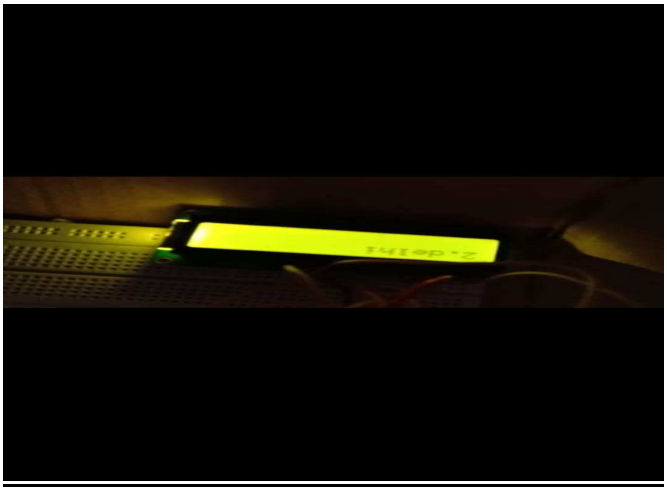
Servomotor

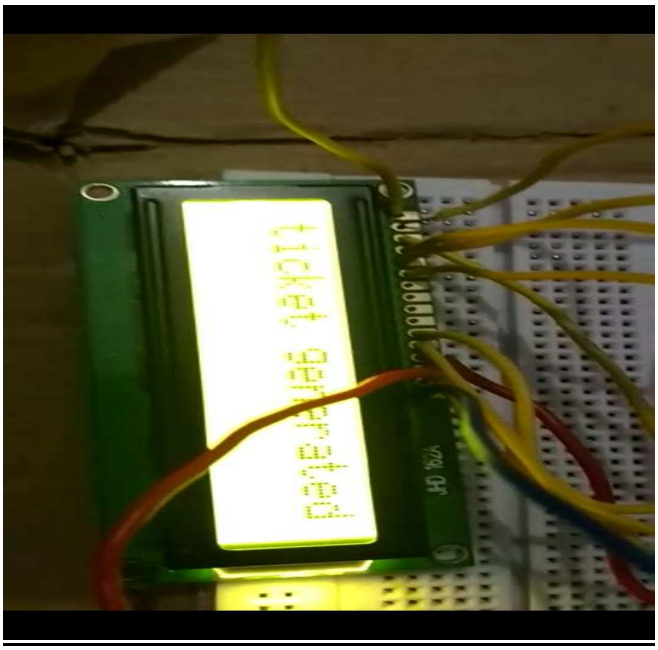
V. SYSTEM ARCHITECTURE



VI. RESULTS







VII. RESULT AND CONCLUSION

This paper shows the power of IOT. This paper presents the most convenient and reliable way of generating tickets. This paper shows how effectively one can use this system to generate tickets. This paper also shows how one can provide security to the travelling passengers. Also checking of tickets become easy by automatic opening and closing of door. Moreover, automatic fare collection ensures conductors does not overcharge to the passengers. WIFI modulo is used to send data wirelessly to database for authentication thus making whole system wireless and fully automated.

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