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RFID BASED SMART TICKETING SYSTEM FOR PUBLIC TRANSPORT SYSTEM

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Abstract: India is second largest populated country in the world so most of the people use public transport .During peak hours issuing tickets to each passenger manually is time consuming and tedious task and also tendering exact change to the passengers is also a problem. The probability of ticket fraud is also high in this case. Since the tickets are made of papers it leads to deforestation and these tickets are of no use once when the passenger gets out of the bus. Passengers should also protect their tickets until they reach their destination. So in order to overcome all these difficulties we have Smart ticketing system is proposed to issue tickets to passengers. In our work we use RFID cards to make identification of passenger and transaction very precise, Reader System is attached to detect the RFID cards carried by the passengers, GPS to calculate the bus fare. Micro Controller to communicate with RFID cards and LCD as display unit.

Index Terms **- RFID card, RFID reader, GSM, LCD**

I. INTRODUCTION

A Smart Ticketing system has its benefits while many people may argue that a switch to paperless will be more expensive, in terms of software and hardware requirements than the traditional paper-based system. Going paperless not only has a huge impact on the environment but also saves costs of ink, paper, labor costs associated with it. By taking into consideration the above parameters, a smart ticketing system using a combination of RFID technology, GSM microcontroller. RFID has proven to be one of the most promising technologies in recent years and can be effectively employed in various applications since it is economical and widely used tool for tracking and locating purposes. A reader will be attached to both ends of the bus. This Reader System is a combination of RFID Reader which serve the main purpose of detecting the RFID cards carried by the passengers, Microcontrollers and GSM technology. The microcontrollers used in this system is P89V51RD2 which is responsible for communicating with the RFID reader. Every RFID card is encoded with a unique identification number. The RFID cards used in this system are passive RFID tags which unlike active tags that require an internal power supply. These tags have a read range up to 10m. The frequency of the RFID Reader MFRC 522 is 13.56 MHz and it's read range is between 10 cm – 1 m. These cards are detected by the reader with the help of electromagnetic fields created between them. While the cards are detected by the reader a micro controller is responsible for fetching the details from the reader system about the balance and bus stations.

II. LITRTURE REVIEW

Some of the previously carried out projects which proved to be very insightful for our proposed system are mentioned here. Nandini M S, Manisha, Pooja D, Poonam Sharma, Ramya M [1] in this paper highlights that the Radio Frequency Identification (RFID) card is used to make the identification of passenger and transaction very precise. RFID cards are distributed among the public. The personal details of the passengers will be collected through which account will be created and RFID cards with Unique identification number will be issued to each user or passenger. Through this database, identification of traveler, verification of traveler and deduction of fare is achieved from their respective accounts. The user will swipe the card only once when he/she get into the bus. Vitthal Waghmare, Rushikesh Santre, Piyush Gupta, Rudull Redijj [2] focuses in this paper RFID as associate economical methodology, by not giving the price tag within the style of paper instead collecting the fare from it in line with their distance travelled and it additionally reduces the consumption of papers that are used for printing the tickets because the

traveller is often carrying the RFID. The RFID contains the data of the passenger and additionally the fare is debited from it. The passengers carrying the RFID are suggested to swipe it within the RFID reader, so the fare is collected from it, but the minimum amount is not fixed. And Bluetooth technology is also available. Prafulla P S, Hema K J, Kalavathi S N, Sharath S, Manikanta G [3] shows in this paper that RFID reader is used to identify the passenger, and uses the database to monitor balance, fare etc. GPS is used to find source place and destination place to calculate the fare and internet access is provided to update the database but doesn't focuses on GSM. Bhumik Patel, Parthvi Pandey, Durvesh V.Sonar,Tina D'abrco [4] depicts in this paper that RFID technology is used with different hardware and software methodology like Arduino, LCD, RFID cards and Wi-Fi module. The passenger or traveler will tap the RFID card on the RFID reader attached at the door of the bus. The reader will scan the RFID card of the user and sends the details to web server. The details will be sent by the WI-FI module to the web server attached on the circuit.. The web server will deduct the balance accordingly for the distance chosen by the user from his account and update the balance by displaying it on LCD screen at the user side. The RFID and Arduino interface is done through which cards can be scanned. Priyadharshini M, Deebiga K, Gomathy G R, Anusha A [5] conveys in this paper how the passenger taps his card on the RF reader while entering into and leaving from the bus. The fare is deducted as points from the Smart card of the user where the minimum balance concept is not adopted using GPS .This system is implemented using IOT based web-application.

III METHODOLOGY

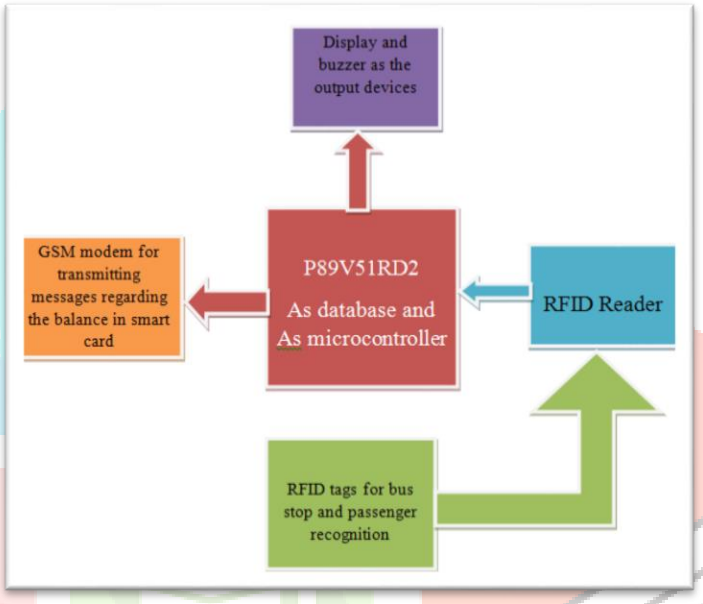

Fig 1: System architecture

As depicted in the fig1 above, the P89V51RD2 microcontroller forms the central part of the architecture which interacts with the RFID Reader, GSM modem and LCD. The RFID card or tags which are issued to the passengers interacts with the RFID readers by tapping on the RFID Reader. The following are the functionalities provided by the components of the architecture.

- RFID Reader reads the RFID cards or tags which is issued to the passengers and calculates the fare according to number of stations travelled by the passenger.
- RFID tags are issued to the Passengers. These tags or cards are tapped on the Reader placed at the door while entering and getting down the bus. The RFID cards are also placed at bus stations.
- P89V51RD2 is used as both microcontroller and database which stores the information of passengers, bus, bus stations, bus fare and so on. It interacts with RFID reader, GSM modem and LCD in order to perform its function.
- GSM modem is used for transmitting messages to the users regarding the balance in the RFID or Smart card.
- LCD is used as a display device or output device which displays the information regarding the user when the card is tapped.
- Buzzer is used to notify the user and conductor when the user doesn't have the minimum balance in his card.

Proposed System

The need for digitalization of fares for the public transport system, is achieved using RFID, where the user has to top up their card for using it and when entering the transport system it would check for the availability of funds in the card by taping the card in the reader which is placed at both the door ends of the bus , if available it would provide access to the service, if not it would indicate the same through a red LED and if the user has to leave the public transport at desired station, the user has to tap the card while exiting, and the fare is collected according to the distance travelled.

The bus stations are notified by the smart card attached to the bus while bus entering into bus stand, the data will directly be transferred to the server main database and the equivalent data will be stored in the corresponding account. The amount is deducted from the passenger card by calculating the number of stations raided from the entered stop this automated system will save time, reduces confusion, eliminates the problem of tendering exact change and have a higher authoritative inspection.

System Modules:

- Passenger/User: The passenger is the one who travels through the bus using his smart card, where he taps the card on the reader and reader identifies his source at that instance of time and he again taps the card while getting down, where the reader identifies his destination and calculates the fare and deducts the fare accordingly
- Bus: The bus module consists of RFID reader, microcontroller, LCD and GSM integrated system where all together perform their function in order to check the user details through their smart card and calculate the fare. Buzzer is used to notify when there is less than the minimum balance.
- Bus Station: This is the module where the RFID cards are attached to the bus stations and RFID reader of the bus reads it and learns which station it is.

CONCLUSION AND FUTURE SCOPE

By looking over to the present ticketing system in public transport system, it is very complicated with respect to time and money. Our project reduces time consumption and requires less man power and also solves the problem of ticketing. Excluding buses, this project can also be implemented in various other public transport services like railways and metro.

REFERENCES

[1] Nandini M S, Manisha,Pooja D, Poonam Sharma, Ramya M "Smart bus fare collection system",2019 International Research Journal of Engineering and Technology (IRJET)
[2] Vitthal Waghmare, Rushikesh Santre, Piyush Gupta, Rudull Redijj, "Conductor less bus ticketing",2019 International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering (IJIREEICE)
[3] Prafulla P S, Hema K J, Kalavathi S N, Sharath S, Manikanta G "Ticketless Transportation using RFID device", 2018 International Journal of Engineering Research & Technology (IJERT)
[4] Bhumik Patel, Parthvi Pandey, Durvesh V.Sonar,Tina D'abrco "RFID based bus Ticketing System",2018 International Journal of Scientific Research & Engineering Trends (IJSRT)
[5] PRIYADHARSHINI M, DEEBIGA K, GOMATHY G R, ANUSHA A "PUBLIC TRANSPORTATION AUTOMATION USING SMART CARD WITH RFID",2020 INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH AND ENGINEERING DEVELOPMENT (IJSRED)
[6] SHREAYA ANDHALE, NIRMAYEE DIGHE, AKANKSHA KORE, DARSHANA GAIKWAD, JAYASUDHA KOTI, "RFID BASED SMART TICKETING SYSTEM",2020 INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS(IEEE)
[7] CHAYAN SARKAR, JAN JAAP TREURNIET, SUJAY NARAYANA, R. VENKATESHA PRASAD, "SEAT: SECURE ENERGY-EFFICIENT AUTOMATED PUBLIC TRANSPORT TICKETING SYSTEM",2015, INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS(IEEE)
[8] K.R.Aravind., R.Arasu, Asick Ahamed.K., R.Rajakumari, "Automatic Ticket Issuing System For Conductorless Buses",2019 International Journal Of Scientific & Technology Research (IJSTR)
[9] M. Pandaravel Kannan, R. Pitchai Kumar Arun, P. Ponselva Kumar, R. Vasanthan, N. Sankar, "Travel Card For State Transport Corporation Using RFID",2020 International Journal Of Scientific & Technology Research (IJSTR)
[10] Rahul Khose, Shreyas Mahangade, Vicky Salunkhe, Nikhil Angane, Poonam Gupta, "Smart Transport Ticketing System Using IoT",2018 International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
[11] Bhat Apoorva, Kavitha C, Bharath M, Nitesh Narayan Vaidya, Harshitha G M, "A Review on Smart Bus Ticketing and Tracking System using IoT"2018 International Journal of Engineering Research & Technoloy (IJERT)
[12] HABIMANA DESIRE, DR NIYIGENA PAPIAS, "SMART BUS TRANSIT SYSTEM WITH RFID",2019 INTERNATIONAL JOURNAL OF SCIENTIFIC & ENGINEERING RESEARCH (IJSER)
[13]Ankit Shah, Riya Rao, Juhi Patel, Leena Raut, "Intelligent Bus Ticketing System",2018 International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering (IJIREEICE)