TICKET GENERATION USING SMART CARD

K.S.S. Iswarya, G. Chandra Sai Sri, S. Pavan Chandu, K. Shamnukha Sai Students,
S. Ravi Kumar Assistant Professor,
Affiliation: Department Of ECE, Vignan's Institute of Information Technology,
Visakhapatnam, Andhra Pradesh, India
iswaryakuchimanchi.4@gmail.com, gchandrasaisri@gmail.com, yespavanchandu@gmail.com,
shanmukhasai500@gmail.com.

Abstract: In our country, there is by and a large presence of difficult issues concerning transport associated with the guide getting to passengers with a paper ticketing system, security, COVID move through the trade of cash, defilement, insufficient change, and wild masses. These all can't be dispensed with right away yet can be diminished somewhat by utilizing RFID smart cards. Smart cards are secure, versatile capacity gadgets utilized in security and related frameworks. This paper manages the traveler access control, ticket generation, and security utilizing IoT, RFID, and GSM.
Key Words: **IoT, RFID RC522 Module, RFID Tags, Arduino UNO, GSM Module, LCD**

1. Introduction

These days the public vehicle framework should be shrewd with quick evolving what's more, edge-cutting innovation. In any case, public vehicles in India have forever been a space where such new advances have not turned their interest. Traveler accommodation should be improved as there is weighty interest for savvy framework on the lookout. In the current framework, there are numerous not kidding issues where one needs to trust that the guide will give access utilizing a printed a ticket which prompts outright deforestation, trade of cash that raised later Coronavirus cases, wild masses that hang to the vehicle entryways, inadequate change, and less security to hand cash. Smart ticket assortment is now being utilized all over the planet. So India needs to step up with executing the smart tagging framework. This venture is completely executed utilizing IoT. By utilizing this we can lessen the utilization of paper, the spread of COVID, and give security to the traveler's cash. This project portrays the zest and excellence of utilizing IoT, a staggering innovation that is utilized to produce tickets consequently with next to no manual work or individual trade of cash. The travelers can be backed out of the strain of purchasing the tickets in a rush which can lead to various mishaps. This undertaking likewise demonstrates the way that main an approved individual can board the transport. This paper shows how RFID smart cards are utilized to produce the transport ticket, and confirm the traveler, prompting a compelling advance towards security and getting the travelers to board the public vehicle with practically no issues. Each traveler should convey an enrolled RFID card which will be examined in the individual transport vehicle for their picked destinations. Whenever the traveler picks their destination, the particular sum will be charged from the card. All the interaction and handling expenses will be displayed on the LCD show. After the ticket is generated the traveler receives a message showing their destination and the remaining balance on their particular RFID card.

2. Literature Survey

Writing audit was done all throughout the entire project to acquire information and further develop the abilities expected to finish this task. The fundamental hotspots for this undertaking are past-related projects, research propositions, books, diaries, and online instructional exercises. This part centers around the essential ideas and all crucial speculations connected with this undertaking and the disadvantages of the ongoing system. RFID innovation can be successfully utilized in a number of uses because of its propensity for efficiency. As for its application, it's been a broad device for both following the travel transports. A major arrangement of RFID comprises two essential parts: The reader module and tags, which will be discussed in detail later in the paper. The primary thought behind this task is to gather the charge consequently utilizing the RFID innovation and GSM modem. In paper [1] the authors explained the advantages of RFID cards about their low cost. In paper [2] RFID cards and a reader is used to read card number which is sent to the database using WIFI. In paper [3] RFID

cards are registered and recharged using a website. In paper [4] the working and advantages of GSM are explained clearly to implement it in the project.

3. Existing System

In an overall manner, each transport is constrained by a guide. The guide will gather cash from every traveler and issue tickets. At first, printed papers or tokens are utilized as tickets. This will take additional time and misuse of the human asset as well as energy. Indeed, even a handheld tagging machine is relatively sluggish and needs a prepared individual to work it. In existing framework to defeat these troubles, involves an RFID with a console where the traveler needs to enter the assignment where he/she will get down. The RFID reader will read the separate data about the traveler from the RFID tag. The particular sum is charged from the traveler's account with the assistance of the RFID tag. But the security framework is poor since anybody can get to the RFID tag. So the execution of tagging framework with a good expansion of utilization of GSMmodem is acquainted with a secure RFID tag.

4. Proposed System

In close to a future public vehicle transport framework with trend-setting innovations like Radio Frequency Identification Device (RFID) will be introduced. The smart card has the traveler's details and records the balance that is credited at the hour of card issue. The cars can be recharged or registered using a website placed in every bus depot. Once the sum is credited, a message will be sent to the traveler's mobile. The RFID reader framework is fixed in the public transport stand. At the point when the travelers go into the public vehicle, the RFID reader identifies the smart card, and the ongoing area of the movement (i.e.) source is distinguished by utilizing the number of transport stops at the bus stand(number of transport stops is counted utilizing IR sensor). Each destination of the bus is shown on the LCD display. By choosing the destination then the distance is determined. The respected amount will be deducted from the traveler's card. A Messaging framework is presented which messages the data about the boarding point and the destination, remaining balance, valid or invalid card, sufficient or insufficient funds, etc., One can also block their cards if they learn to know that their card is stolen or being used by others without permission. For example: If the traveler lost the smart card there is a possibility of abusing the card by outsiders it tends to be conquered through a one-time password (OTP) framework traveler can get to the smart card.

5. Block Diagram
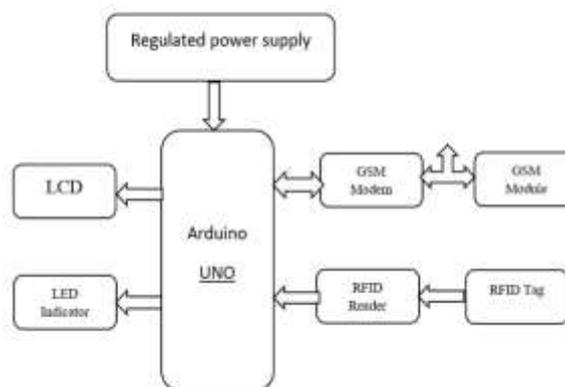
Figure 5.1: Project Architecture

6. Algorithm

Step 1: Start
Step 2: Initialize the system and display a welcome message
Step 3: Search for RFID tags, if not detected then search again
Step4: Scan/Read RFID traveler's card/tag

Step5: Read the related details from the memory

Step6: If the traveler is authorized: provide access to the ticket, else: display "Invalid/ Unregistered"

Step7: Based on the destination, deduct the amount and display the balance on the LCD

Step8: Send the ticket generated as a message to the traveler's mobile
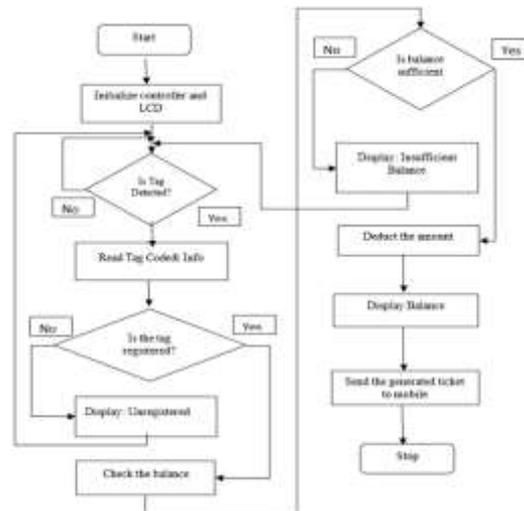
Step9: After processing, go to step 2

Step10: Stop

Figure 6.1: Flowchart

7. Hardware Components

7.1 RFID Reader

A Radio Frequency identification reader (RFID reader) is a device used to gather information from an RFID tag, which is used to track individual objects. Radio waves are used to transfer data from the tag to a reader. RFID is a technology similar in theory to bar codes. However, the RFID tag does not have to be scanned directly, nor does it require line-of-sight to a reader. The RFID tag it must be within the range of an RFID reader, which ranges from 3 to 300 feet, in order to be read. RFID technology allows several items to be quickly scanned and enables fast identification of a particular product, even when it is surrounded by several other items. RFID tags have not replaced bar codes because of their cost and the need to individually identify every item. Here we used a popular RFID reader namely, RFID RC522. It has 8 pins and it is very easy to use and interface with the Arduino UNO.
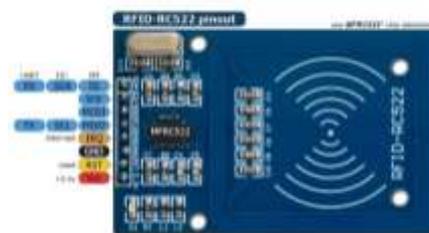

Figure 7.1.1: RFID RC522 Module

7.2 RFID cards

An RFID reader is a device used to gather data from an RFID tag that is employed to trace individual objects. Radio waves are used to transfer signals from the tag to a reader. RFID is also a technology similar in theory to bar codes. The RFID tag should be within the range of an RFID reader, which ranges from three to a few hundred feet, and soonscannedscan. RFID technology permits many things to be quickly scanned and permits quick identification of a particular product, even once it's encircled by many various things. RFID tags haven't replaced bar codes thanks to their price and therefore they have to singly determine each item.

Figure 7.2.1: RFID Smart cards

7.3 Arduino UNO

The Arduino Uno R3 is a microcontroller board based on a removable, dual-inline ATmega328 AVR microcontroller. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs). Programs can be loaded on to it from the easy use Arduino computer program. The Arduino has an extensive support community, which makes it a very easy way to get started working with embedded electronics. The R3 is the third, and latest, revision of the Arduino Uno

Figure 7.3.1: Arduino UNO

7.4 LCD with I2C

This is LCD 1602 Parallel LCD Display that provides a simple and cost-effective solution for adding a 16×2 White on Liquid Crystal Display to your project. The display is 16 character by 2-line display that has a very clear and high contrast black text upon a green background/backlight. This is the great green backlight LCD display. It is fantastic for Arduino-based projects. This LCD1602 LCD Display is very easy to interface with Arduino or Other Microcontrollers. This display overcomes the drawback of LCD 1602 Parallel LCD Display in which you'll waste about 8 Pins on your Arduino for the display to get working. Luckily in this product, an I2C adapter is directly soldered right onto the pins of the display. So all you need to connect are the I2C pins, which show a good library and little of coding. The I2C is a type of serial bus developed by Philips, which uses two bidirectional lines, called SDA (Serial Data Line) and SCL (Serial Clock Line). Both must be connected via pulled-up resistors. The usage voltages are standard as 5V and 3.3V.

Figure 7.4.1: LCD Display

7.5 GSM Module

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone.When a GSM modem is connected to a computer, this allows

the computer to use the GSM modem to communicate over the mobile network. these GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS and MMS messages.

Figure 7.5.1: GSM900A Module

8. Working and Implementation

1) This process can be done while waiting for the bus at the stop or on the bus. This could help to control the masses and quickly generate the tickets without any exchange of money which may lead to COVID 19.

2) Every time when a passenger enters the bus, the passenger needs to swipe his RFID tag/token in the RFID reader. The RFID tag has a unique passenger ID, status register, balance, and other blocks

3) Once the card is read it checks whether the passenger is authorized or not. If authorized, it grants access to generate the ticket else the LCD displays "Unregistered".

4) If The card is valid, then the next step is to check the balance.

5)IF the balance is less than a threshold value, then the LCD displays "Insufficient balance, please recharge your card" else the passenger is requested to enter the destination point.

6)In this proposal, we introduced a security measure to the RFID cards. If the passenger loses the smart card, there is a chance of getting misused. To avoid this, every time the ticket has generated a message will be sent to the registered mobile number. If the passenger did not use the card then they can request to block the card.
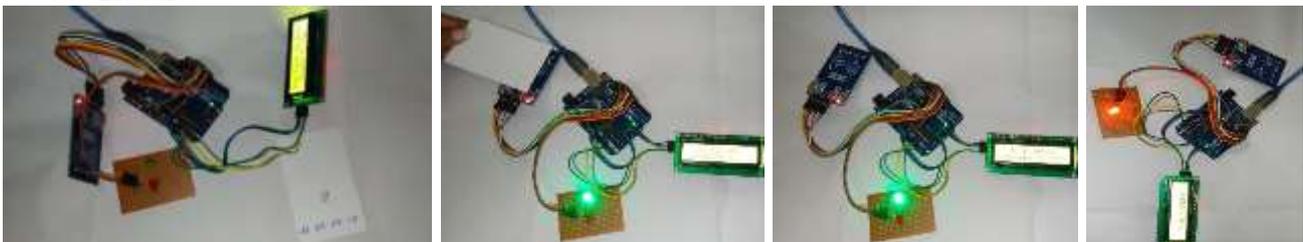
9. Results

Figure 9.1: Final Product with display   Figure 9.2: Successful payment   Figure 9.3: Balance display   Figure 9.4: Unregistered card

The proposed model is simply available and helpful to utilize. It doesn't need extraordinary preparation. The labor supply is diminished and will save time that the traveler spends in the ticket queue. Numerous tickets can be generated at in same time which is valuable for job-holding passengers. Time productivity and cost proficiency are ensured by this smart billing framework. As we can see in figures [9.2, 9.3], the LED indicates Green if the passenger is authorized, has a sufficient balance, and the payment is successful. The LED indicates Red in figure [9.4] because the reader detected an unregistered card. Also when the card doesn't have sufficient funds, the LED indicates Red.

10. Conclusion

The proposed framework defeats the manual ticketing system by automated framework transport utilizing a GSM modem and smart card. It is an imaginative thought which diminishes the transport passage and labor. Trendsetting innovation of smart cards to get is carried out. This development can make more advancements to the current transport system. "Ticket Generation Using Smart Card" is

planned with the expectation that it is more efficient and accommodating for travelers and guides during the travel. Travelers can identify the total sum for each destination in this Smart Transport. The travelers can have information on the amount they are spending on Transportation.

11. Acknowledgments

References:

1. V. Apsara, "RFID based bus ticketing system for Public Transport System (PTS)", International Journal of Industrial Electronics and Electrical Engineering (IJIEEE) Vol. 4, Issue 5, May 2016.
2. Sunitha Nandhini. A, "AUTOMATIC BUS FARE COLLECTION SYSTEM USING RFID", International Journal of Advanced Research in Computer and Communication Engineering (IJARCCE) -Vol. 5, Issue 3, March 2016
3. "RFID BASED BUS TICKET GENERATION SYSTEM" Aman Kaushik, Kumar Sanu, Kajol Singh, Aayush Raj, Sumitra Kumari- Volume: 06 Issue: 07 | July 2019
4. Antony Fernandes. F, Lokesh.s, Harikrishnan. N, Karthikraja.M, "Smart Bus Fare Ticketing System Using RFID Technology And GSM Module." (NCETSEM'18)-2018
5. GSM- https://www.electronicscomp.com/sim900a-gsm-gprs-module
6. LDC I2C- https://www.electronicscomp.com/1602-16x2-lcd-display-with-i2c-iic-interface-green-backlight
7. Arduino UNO- https://probots.co.in/arduino-uno-r3-atmega328-compatible-board.
8. RFID RC522- https://robu.in/product/rc522-rfid-card-reader-module-13-56mhz