



# Automatic Public Transport Ticketing System

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**Abstract**— In our day-to-day life basis most of the people were depending on the public transport system. There may be many issues with the public transport like comfort issues but we prefer to it. This is due to the low fare and availability. This system aims in reproducing the conventional ticketing system with a easier and time saving alternate one. The conventional system requires a ticket collector who issues ticket and it may cause human errors and possibility of cheating. Moving onto this automatic prototype, passengers boarding and get down will be charged automatically and accurately. This also solves out the money change issue. In the motive to promote digital India initiative, this system evolves with digital payments and reducing manpower.

**Keywords:** RFID Tag, Internet of Things, Message, Raspberry pi, neo 6M GPS Module.

## I. INTRODUCTION

### PUBLIC TRANSPORT TICKETING SYSTEM

remains the major source of income in most of the developing countries like India. But Public Transport Ticket Collecting System faces various security problems and severe malfunction. There is a lot of confusion between the passengers regarding fares which lead to quarrels and corruption. But nowadays there is a severe security crisis in PTS due antisocial elements. The 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. The use of RFID cards and switches, and can be used to make the transaction and travelling very precise. This paper basically deals with the ticketing of the passengers travelling by the bus. The future extensions of Automatic public ticket collecting system in areas such as Internet- of-Things (IoT).The idea of using RFID in PTS was previously put forward by different personalities . But the system proposed closer to a future ticketing system than anything else.

Usage of Raspberry Pi is a major feature owing to possibilities of future expansions and alternations. In future, the new systems can replace Raspberry Pi, more reliable systems are expected to come into existence. Raspberry pi has been an emerging technology in recent years. RFID and Raspberry pi technology can be effectively employed in the number of applications due to

its penchant for efficiency. It's application, has been a widespread tool for both transmit transports and tracking 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.

Identification of objects is a huge task ahead of IoT and usage of RFID in PTS can be considered a step towards implementing IoT. 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.

This paper categorized as modelling of the Automatic public ticket collecting system and experimentation with validation of the work.

## II. PROPOSED SYSTEM

The proposed system will reduce the man power and chances error is reduced. Promoting digital payments by providing a transport e-card to every passenger and thereby money exchange issue sorted out. There is no possibility of overcrowding because of the strict following of seating capacity issued by transport authority. The passengers are charged based on their step in and step out points. All transport records are planned to be maintained and also helps out for reaching out criminal suspects.

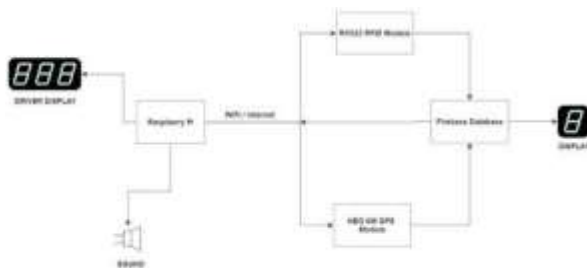


Figure: 2.1 Block diagram.

## III. CIRCUIT,IMPLEMENTATION

### **Figure :3.1 Circuit diagram**

The Positive pins of the GPS Module and RFID is connected with raspberry pi respectively with 5v. In RFID the SDA is connected with pin 24 , SCK is connected with pin 23 , MOSI is connected with pin 19, MISO is connected to pin 21, GND is connected with pin 6, RST is connected with pin 22, and the 3.3v is connected to the pin 1 in raspberry pi respectively. IN GPS Module the Vcc is connected to the positive pin then ground is connected to the negative pin. The RX pin is GPS is connected with the pin 14 in Raspberry pi and Tx is connected with pin 15 respectively. IN Display the Vcc pin is connected to positive and ground is connected in negative. In Display SCA pin is connected in SCA pin in Raspberry pi then the buzzer positive pin is connected to pin 16.

#### **A. RFID over Ticket Vending**

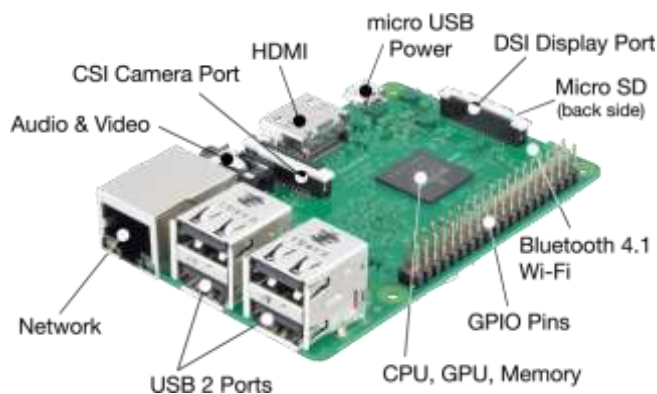
In conventional paper based ticketing, the bus conductor prints and seals lots of tickets with the fare and the date on the ticket. These tickets are thrown away after the travel by the passengers polluting the environment and causes loss of trees from which the paper is manufactured. Using automatic ticket systems time and personal costs of the transportation authorities can be saved. It enables an organized way of fare collection. Low maintenance costs and reduced fraud-induced further advantages.

#### **B. RFID over Smart Card**

RFID is cost effective as it requires lesser memory space. It provides a single technology system which reduces the maintenance cost. RFID ticketing provides a single technology system which consequently reduces the maintenance cost.

#### **C. Requirements of Raspberry pi**

Raspberry Pi is an ARM-based credit sized computer that could be plugged into a computer monitor or TV, keyboard, and mouse to operate. It works on Raspbian operating system and has a quad-core cortex A-53 processor. It has a set of 40 GPIO pins. The available clock speed is 1.2GHz. It has four USB ports and wireless connectivity can be enabled using Bluetooth and Wi-Fi. It can be programmed using Python. An Ethernet port is provided for connecting to the Internet.



**Figure: 3.2 Explanation of Raspberry pi**

**Enabling:** The first step is to enable SPI on the Raspberry Pi and open a command line window and enter raspberry configuration. This will open the Configuration Menu. Select menu for “Interfacing Options.” Select “SPI.” To enable the SPI Interface select yes. The Configuration menu say “The SPI interface is enabled.” To finish enabling SPI open the command line terminal and enter the command. Then the Raspberry Pi can finish enabling SPI.

**Installing packages:** The first step is to install Python

2.7. This is done by entering `sudo-get install Python 2.7`. The SPI PY Library is used interface with the RC522 module. I clone the library by typing the command `git clone https://github.com/Ithiery/SPI-PY.git`. The library needs to be installed. First, enter the SPI-PY directory by typing `cd SPI-PY`. Then install the library, `Sudo python setup.py install` adding to `Read.py`

`Read.py` is the script need to change to talk to the RC522 module. While editing this script, scroll to the bottom of the script and comment out “Authenticate.” This tutorial doesn’t cover RFID authentication. Be sure to import time library at the header of the script. Next find the section with the heading “#Configure LED Output Pin.” This is Where you should configure the out pins to the solenoids.

Next go to the heading “#Check to see if card UID read matches your card UID”. This If/Else statement checks the UID read matches your card UID”. This If/Else statements checks the UID the reader reads from a card to a UID then saved in the script. If the UIDs match, the actuator is outputted to a HIGH.

**Getting the UID:** The first time running the script need to get the card’s UID. An RFID card UID is a unique number associated with the card, similar to a a serial number. To run the script, change directories to the directory to saved the script in. Run the script by typing `python Read.py`. Because the script has my card’s UID on it , when you place card up to the reader it will deny access. The card’s UID will be displayed on the screen.

**Final Script:** Run the script again by typing python Read.py now place your card to the reader, access should be granted and the LED will turn on for 5 seconds.



**Figure:3.3 RFID uploaded to fire base**

While Showing the RFID card the data gets Uploaded to the firebase database. The data contains ID of the RFID and the name of the Person.



**Figure:3.4 Access Granted**

Thus, the ID and name of person are uploaded to the database.

#### **IV. CONCLUSION**

Science and technology has made the society broad and digitized to a greater extent. Integrating the latest technologies with the transportation could prove a lot of improvements to the society and social life. This system recommends the public to take decisions based on the present circumstances and future predictions.

By using Automatic public ticket collecting system, the au system is increases the economic growth. This model aims for the development of public; with low cost and energy efficient to readily accommodate the transportation. Therefore, a sustainable development is achieved by this modern transportation system.

#### **REFERENCES**

- [1] S.V.Arun Das and K. Lingeswaran, "GPS based Automated Public Transport Fare Collection Systems Based on Distance Travelled by Passenger Using Smart Card," in International Journal of

- Scientific Engineering and Research (IJSER) vol.2 Issue 3, March 2013. [2] Rawdah Rawdah and Syed Shafin Ali, "Proposing a Real-Time Ticket Monitoring system for Public Transport," in 2021 2nd International Conference of Robotics, Electrical and Signal Processing Techniques (ICREST).
- [3] Md. Foisal Mahedi Hasan, Golam Tangim, Md. Kafiul Islam, Md. Rezwanul Haque Khandokar, Arif UI Alam, "RFID-based ticketing for public transport system" in 2013 3rd International Conference on Computer Science and Technology.
- [4] PT. Manikandan, PG. Kalaiyarasi, PK. Priyadharshini and PR. Priyanga "Conductor less Bus Ticketing System Using RFID and Accident Information through GPS and GSM," in IJSET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 9, September 2015.
- [5] A. Shibashi, N. Mizoguchi, K. Mori, "High Speed Processing in Wired and Wireless Integrated Autonomous Decentralized System and its Application to IC Card Ticket System", in 3rd IEEE International Workshop on Autonomic & Autonomous Systems (EASE'06). [6] A. Shibashi, "Autonomous Decentralized high speed processing technology and the application in an integrated IC card fixed line and wireless system", in IEEE, Proceeding Autonomus
- [7] Deka Ganesh Chandra, Ravi Prakesh Swati, Lamdharia, "Mobile Ticketing System for Automatic Fare Collection Model for Public Transport" in IEEE, 2013 5th International Conference and Computational Intelligence and Communications Networks.
- [8] Ufuf Demir Alan and Derya Birant "Server Based Intelligence Public Transportation System with NFC" in IEEE Intelligent Transportation System Magazine, Volume: 10, Issue: 1, January 2018.
- [9] J. Gronman, P. Sillberg, P. Rantanen and M. Saari, "People Counting in a public Event Use Case Free to Ride Bus" in 2019, 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO).
- [10] A. Antonia, Nunes Terasa Galvao, Joao Falco Cunha, "Passengers Journey Destinations Estimation from Automated Fare Collection System Data using Spatial Validation", in IEEE Transactions on Intelligent Transportation Systems in 2016, volume: 17, Issue: 1.