Automated Ticket service for public Service Using IOT

Mr.S.Ohm shankar [a*],Mrs. D. Maheswari [b*] ,

Department of Electronics and Communication Engineering, Agni college of Technology. Chennai 600130 Tamilnadu India
a e-mail: ohmshankar.ece@act.edu.in, b e-mail: maheswarid.ece@act.edu.in

Abstract

Railways are the convenient, reasonable and popular node of transport in almost all major cities of not only in India but also all over the World. Railways are the most widely used and comfortable nodes of transportation system. When the passengers are in a hurry, they have to get ticket in a long queue. In this project we are neglecting that tedious process. In order to ensure the passenger journey with no quarrels and employ this ticket friendly solution that replaces the traditional paper ticketing, and RFID tickets and online booking. In this project a passenger with a RFID tag and smart phone traveling in train would pay with the phone at the exit without ticket on hand. A smart phone would take care of ticket process with the help of mobile application. An application will be developed which is inter linked with the IOT. The application is developed for the passenger details. The payment details is shown from the database in the mobile application for individual user with login ID.Finally the Payment through e-wallet or railway counter. The main objectives of this project is to avoiding queuing system in railway stations and catching the train at right time.

Keywords—RFID,Smartphone,IOT,Mobile application.

1.0 Introduction

Public Transport system (RAILWAY) remains the major source of income in most of the developing countries like India. However, PTS now faces severe malfunctions and various security problems. First, there is a lot of confusion between the passengers regarding fares which lead to quarrels and chaos. The user friendly automated ticketing and this project aims to offer advancing technologies for overall development of the railway station. This is possible by use of RFID cards and GPS technology that can be used to make the transaction and travelling very precise. This paper deals with the identification and ticketing of the passengers travelling by the train.

In this paper, we have implemented an automated process for ticketing system in the Public Transport, which is mainly based on RFID and GPS technology. A user-friendly app "WIWO" has been developed on Android Operating System (OS) to make the whole journey of a passenger enjoyable and hassle-free. Usually the passenger travelling with the paper ticket .Moreover, after the passenger reaches the destination, the ticket is of no use, and is thrown away. This causes loss to economy. The problem is eliminated with the use of RFID based smart cards, the passenger can take a cashless ride. A passenger with a RFID tag and smart phone traveling in train would pay with the phone at the exit without ticket on hand. The smart cards or tags are

reusable over a particular time period, for a month or a year. So, a much secured journey is ensured for the commuter carrying such cards.

In addition, the Android application, which has been developed as a user interface, has much to offer. The app takes in the tag-ID of the passenger as soon as he/she swipes the card .The GPS location of the entry stoppage of the passenger corresponding to that tag ID is stored automatically in the SQL database . As soon as the next stop arrives, the GPS location gets updated, Now, when the passenger reaching the destination, and again swipes his /her RFID card in the card reader. The GPS location of his exit-stoppage is noted eventually. According to the route distance between departure & destination, the fare is calculated and debited from the RFID tag based ticket electronically using a specifically developed android app "WIWO".

II.   PROPOSED SYSTEM
The proposed system has the RFID tag that detect the passenger details and calculates the distance of travelling through the database via Arduino which is then loaded in the developed "WIWO" application.

Block Diagram:
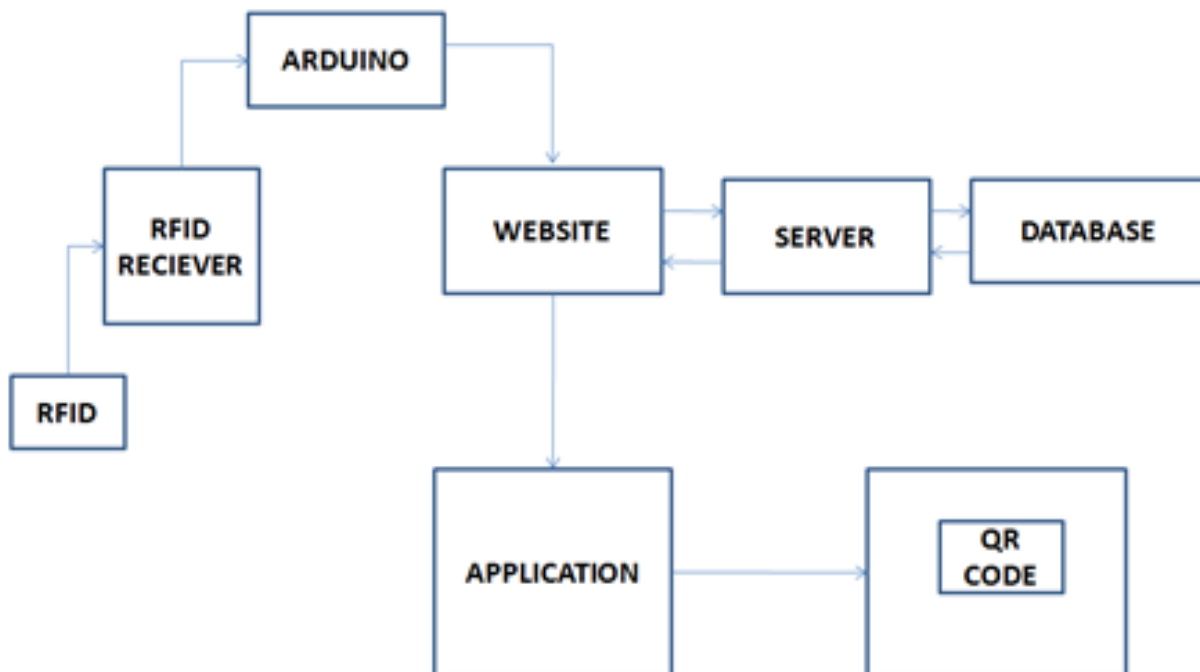

Fig 1.Block diagram

The mobile user has an RFID tag attach. Fed to the rear panel of his mobile. This RFID tag has a unique ID, will be verified at server at station. The user holds the mobile in front of the RFID reader located at the station. Through the RF link the RFID reader reads the ID through serial communication sends it to the main server. The main server sends a request to the database manager for the record set from the database created using SQL.
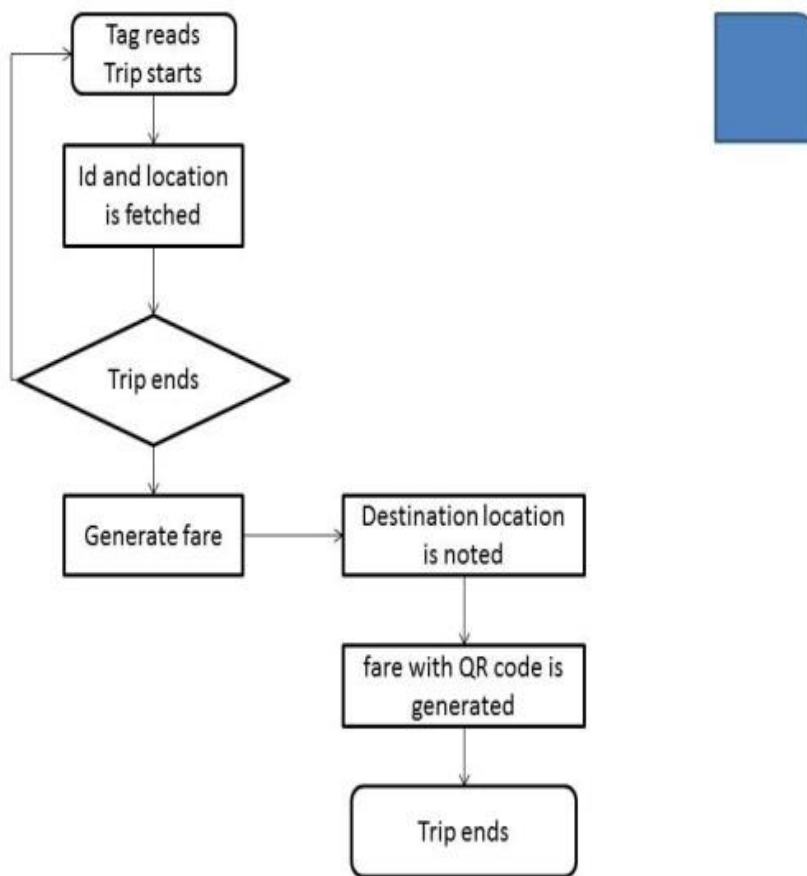
Fig 2.Flow diagram

B. SYSTEM FLOW:

The passenger travelling in train with our specially designed system named "Walk in walk out free". And it directly boards a train without wasteing the time on standing in a queue are getting a new tickets. How come this will be possible without getting a tickets and starts travelling in a train.This only possible in our proposed system.

C.HOW COME IT WILL BE POSSIBLE:

PHASE 1:ENTRY
The passenger travelling with on our own custom designed RFID tag, and enters into the train. The gateway of train has a RFID reader ,while the passenger enters the RFID reader reads the RFID tag .

The RFID tag holds the any specific information about the user. When the user entering the train the reader reads the user id ,user boarding location ,boarding time, boarding station.

While even this takes place in our smart phone there will a specially designed application will turn on and also turn on trip automatically if not the person can himself turns on the trip manually(RARE CASE).
The above collected data are allocated and moved to arduino. This arduino place a major role here, because Arduino is microcontroller. With help of WIFI module or LAN the data are stored in server and majorly called as cloud.

Cloud is a data base here which hold every bit of data in our system (PHASE 1. PHASE 2,end phase)
Phase 2: EXIT-At the end of the travel the passenger reach the destination ,while getting down from the train .The reader reads RFID tag once again passengers personal identification number, time, destination location, destination stop. This detail again processed by arduino and datas move to the cloud, Now the cloud has two set information:Phase1-Entry.Phase2-Exit.

   The cloud send the phase1, phase2 details to the android Application on finishing the entry and exit cycle.The Application automatically generate the fare as per phase 1 location details and phase 2 location details .Now the fare is generated. And as well as QR code (fare details) is generated And phase 2 is completed. The App will have e-wallet, the user can recharge the e-wallet using net banking or other option, while travel is finished and QR will be generated. At this time the passenger can pay with the help of e-wallet or else if passenger forget to pay the fare, the App will automatically reduce the debt fare as per some given time. END PHASE: In this case some passenger can travel without smartphone or smartphone can be switched off. This APP   was not installed at this case anybody can travel without ticket, so that we developed a new one.

B.   Electronic Components:
1.Hardware Requirements
RFID
  The "Radio Frequency Identification (RFID) is an automatic identification system. RFID uses RF to identify "tagged" items. This data is then collected and transmitted to a host system using an RF Reader. The data transmitted by the tag may provide identification or location information, or specifics about the product tagged, such as price, color, date of purchase, etc."
RFID System Components:
 • Tag –Transponder: Tags are typically composed of a microchip for storage and computation, and a coupling element, such as an antenna coil for communication. Tags may also contain a contact pad. Tag memory may be read-only, write-once read-many or fully rewritable.
• Reader –Transceiver: An RFID reader is a device that is used to interrogate an RFID tag. The reader has an antenna that emits radio waves; the tag responds by sending back its data.
 • Backend System
Maintaining the Integrity of the Specifications.
GPS:
GPS or Global Positioning System is a network of orbiting satellites that send precise details of their position in space back to earth. The signals are obtained by GPS receivers, such as navigation devices and are used to calculate the exact position, speed and time at the vehicles location.

2.Software Requirements
1.SQLite 2.Android SDK 3.QR code

1.QR code:
A QR Code(it stands for "Quick Response") is a mobile phone readable bar code that can store website URL's,plaintext,phone number, Email addresses and pretty much any other alphanumeric data. Those little jumbled squares were originally designed for track cars through manufacturing process but today, quick response(QR) code can be found everywhere from assembly line to warehouses.Think of them as barcodes on steroids, more information in less space.QR codes are 2D barcode that can store more than 4,000 alphanumeric characters in a limited horizontal and vertical space. A traditional linear (1D) barcode can hold roughly 20 horizontal characters. QR codes are also easy to use and can be easily read from any direction with a simple smartphone application or dedicated barcode scanner.QR codes are magical because they can read from any orientation.The squares are position dedication patterns, which allows for 360 degree, stable, high-speed reading.

2. SQLite :
SQLiteis a relational database management system. In contrast to many other database management systems, SQLite is not a client–server database engine. Rather, it is embedded into the end program.SQLite is ACID-compliant and implements most of the SQL standard, using a dynamically and weakly typed SQL syntax that does not guarantee the domain integrity. SQLite is a popular choice as embedded database software for

local/client storage in application software such as web browsers. It is arguably the most widely deployed database engine, as it is used today by several widespread browsers, operating systems, and embedded systems (such as mobile phones), among others. SQLite has bindings to many programming languages.

3. Android SDK :

Android software development is the process by which new applications are created for the Android operating system. Applications are usually developed in Java programming language using the Android software development kit (SDK),but other development environments are also available. The Android software development kit (SDK) includes a comprehensive set of development tools. These include a debugger, libraries, a handset emulator based on QEMU documentation, sample code, and tutorials. Currently supported development platforms include computers running Linux (any modern desktop Linux distribution), Mac OS X 10.5.8 or later, and Windows 7 or later. As of March 2015, the SDK is not available on Android itself, but software development is possible by using specialized Android applications.

Conclusion:

The system is fully automated, reliable, transparent and convenient. The cards being reusable, they are much more convenient compared to the paper based ticketing system.. Initially the RFID system was made operative with Pi. Then the control over door handling with the use of RFID tags and reader are made possible. A GPS service was added for the distance measurement. Following this, a database was created and accessed via internet.

The scope for the project RFID based fast Ticketing System for Local Trains has thus been thoroughly studied and also the implementation of the same has been taken care of successfully. Even if currently this system is meant to be implemented just for academic project purpose but the motive behind this project is to actually create a revolution in the ticketing world for the ease of the commuters of the 22nd century.

References:

P. Bahl and V. Padmanabhan. Radar: an in-building rf-based userlocation and tracking system. In INFOCOM 2000. Israel.

P. Fraga-Lamas, D. Noceda-Davila, T. M. Fern´andez-Caram´es, M. D´ıaz-Bouza and M. Vilar-Montesinos, "Smart pipe system for a shipyard 4.0,"in Sensors, vol. 16, no. 12, pp. 2186, 2016.

T. M. Fern´andez-Caram´es, "An Intelligent Power Outlet System for the Smart Home of the Internet of Things," in Int. J. Distrib. Sens. Netw.,2015.

Dr. Prasun Chowdhury, Poulami Bala, Diptadeep Addy, Sumit Giri, Aritra Ray Chaudhuri, "RFID and Android Based Smart Ticketing and Destination Announcement System" 2016 Intl. Conference on Advances in Computing, Communications and Informatics (ICACCI), Sept. 21-24, 2016, Jaipur, India.