Digitized Bus Ticketing Framework

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ABSTRACT

Smart Card technology is used to getting the ticket by withdrawing money from passenger's e-wallet inside the smart card instead of transaction of direct money, loss of coin change is prevented. The smart card is scanned using the app by the conductor and after entry of passenger details the device will generate the tickets and money will be directly debited from their E-wallets. This technology is processed by the module in which the fare calculations are programmed. In addition to this a new feature is added that is if the passenger doesn't buy the tickets within a specific time a beep sound will be emitted and the particular person must buy the tickets. By this many frauds can be stopped.

I. INTRODUCTION

Our project is based on the concept of smart bus technology with the evolvement of digital INDIA. The project involves the use of smart card , a plain card programmed with QR code and E-wallet technology. The process is very simple , the passenger while travelling in a bus has to show his smart card to the conductor. The conductor has the app which we developed and scans the smart card using his mobile. The QR code is used for scanning. Once Scanned the passenger details pops-up inside the app. The travelling details and fare is entered by the conductor and the money is deducted from the E-wallet of passenger's. In addition to this we have also added beep sound technology wherein a beep sound is alerted when the passenger fails to buy the ticket within a given time and the conductor can check the beep and produce ticket to that passenger. Our app is also very simple to use which is applicable practically, it has a login page through which the conductor can login using username and password. In the next step the scanner opens up and the conductor has to scan the card which is mentioned earlier. Through QR code he scans the card and the

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database linked within the module identifies the person and logs in. Then the person has to update his E-wallet balance through payment gateways. The conductor then prints the required tickets and deducts the money from the E-wallet. Through this many fraudsters can be avoided and loss of small coin change is eradicated.

Public buses are the most used transport facilities in many cities today. Passengers face difficulties due to lack of proper management by the bus operators and their managers. But the main problem arises by the method of manual ticketing where rise of population is a major reason because many problems and confusions are caused in the process. Passengers as well as conductors face problems during the peak hours as many people forget to give and receive proper change(coins). Due to this, a huge amount leads to loss of money. So by creating a new app we have analyzed and plan to reduce the pressure and tension caused by this method.

Many buses operate in different routes and we assume that no misuse of this system occurs between them on their journeys. Passengers get down and board again at every stop. The conductor will get the smart card from each passenger and print ticket.

Starting at now , printed papers or tokens are utilized as tickets. These days, convenient electronic gadgets are utilized to print tickets. This technique for printing has numerous cons. The traveler needs to convey the tickets till the finish of his voyage and the conductor must ensure that everybody has the issued ticket. The time taken for manual ticketing is nearly more and measure of paper required is likewise of colossal amount to process the ticket.

In our concept, conductors are instructed to operate the portable electronic ticketing system. Consider a case wherein, if a passenger wishes to travel by bus, He has to carry absolute change with him. Then the conductor will collect money and he will give ticket. This procedure is the same for all people travelling. This will consume time and human energy. Handheld ticketing machine is relatively slow and needs specified users to operate.

Already RFID (Radio Frequency Identification) code reader is used to scan the RFID tag but the desired location should be entered by conductor, so that cash will be deducted on its own from that account of the passenger. Here if once the specified location is arrived, bus will not come to halt inevitably. But reasonably such arrangement consumes time in case of validating tag of each person, so as to overcome that, employment of e-ticketing system is made effective. To this concept, addition of some features is added to provide facts about the bus records. In proposed method, we are suggesting QR (Quick Response Code) reader. In this method, we have designed a user friendly android application for printing ticket. After inducing amount, user has to read that QR code captcha.

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Then it will debit amount from our bank account linked to E-wallet. Each conductor will have QR reader and after reading the values it will get stored in the database. Then the user will get a prompt for the debited amount and the conductor prints the receipt for the ticket purchased.

RELATED WORKS:

The existing system works on the concept of manual ticketing. The conductor has to collect the ticket bundles from the depots and then have to give those to the passengers by tearing or punching those tickets. The passengers too forget to get the proper changes or sometimes even leave it as the amount is small. Here difficulty arises when the conductor runs out of change(coins),he writes the amount on the backside of the ticket and not always all those change due are given back to the passengers.

Issue of half Student Reduction application approaches, Registration and Issue of Point to Point card with tokens for each scholastic year is being done through the particular instructive schools. For the inevitable months, start to finish card will be issued straightforwardly to the understudy at the Sales stations. Manual records of transport subtleties are not noted consistently and it is a confused procedure. Fuel records are likewise not noted legitimately and some of the time bogus estimations of expense may be given to the stations. The E-Ticketing framework was set up which expelled the old-style ticket boxes which had packaged tickets of various qualities. It was a tough and quick work in crowded bus to operate that traditional ticket box calculating different variant of tickets from slots to be given to commuters along with exact change. Confronts of Conductors and passengers on buses was normal due to conductor asking for change and passengers not having.

In current system RFID Reader is used to read the RFID tag but the end place should be entered by the person travelling in keyboard, So that amount will be deducted automatically from the tag. Here if once destination is arrived, bus has to come to a halt. Fairly such arrangement requires more time in case of processing of tag for each individual. So to beat that, implementation of ticketing system without access is developed in this method with addition of application to transfer data and information about accidental emergencies. The internal memory chip and RFID based personalized bus pass smart cards contains passengers information like type of Bus Pass, Duration and date of expiry, Unique pass number, Digitized Photo ID, Name and Gender of pass holder. Upon inserting this pass into the ETM machines with conductors, tickets can be issued and other details about card can be validated. Renewal of these passed can be done at various points of sale and also online. About 1 million RFID cards been already in use.

This paper represents a computerized framework for ticketing in the Public Transport System (PTS) which chips away at the rule of traveler ID. This is an easy to understand helpful framework, which will naturally recognize the individual and deduct the traveler's admission sum as per the separation voyaged. The Radio Frequency Identification (RFID) card and GPS are utilized to make the recognizable

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proof of traveler and exchange precise. The cards being reusable, they are substantially more versatile contrasted with the paper based ticket framework. RFID cards are shared among the general population. The unique ID in the RFID cards are stored in a database in the device along with personal data and creates separate accounts for each person. By accessing this database, it is easy to identify the traveler, check his account and deduct the fare from his/her account. Creating database eases efficient filtering of bad elements and gives strong assurance to both passenger and PTS about the transaction.

Passage figuring is finished with the assistance of GPS module and web. Along these lines, a difference in admission does not make any preoccupation as toll computation is finished by valuating position by GPS module and rate through web. Subsequently, this framework separates human mistake and endeavors as it were. The RFID reader used is MFRC522. Minicomputer Raspberry Pi is utilized as control unit and writing computer programs is finished utilizing Python. module 02 is utilized with the end goal of span estimating. Servo engines and LCD are utilized for controlling and observing separately. Open Transport System remains the real wellspring of pay in a large portion of the creating nations like India. However, PTS presently faces extreme deficiencies and different security issues. Foremostly, there is a great deal of disarray among the travelers with respect to charges which lead to fights and interruption. Likewise, these days there is extreme security issues in PTS because of awful components. The easy to use mechanized ticketing framework recommended in this paper won't just consequently deduct the traveler's passage as indicated by the separation voyaged yet additionally distinguish the traveler's recognizable proof. This is conceivable by utilization of RFID chips and GPS, and can be utilized to make the exchange and voyaging exceptionally precise. This paper essentially approaches with the recognizable proof and ticketing of the travelers going by the transport. Additionally considers conceivable future expansions of this framework in zones, for example, Internet– of-Things (IoT).

The idea of using RFID in Public Transport System was previously suggested by different institutions. But the system implemented here stays closer to a future ticketing system than anything else. Handling of Raspberry Pi is another important feature corresponding to possibilities of future expansions and alterations. With the rise of new systems to replace Pi, smaller and more reliable systems are expected to come into modern usage. RFID has been a developing innovation lately. RFID innovation can be successfully actualized in number of uses because of its inclination for productivity. With respect to its application angles, it's been an across the board apparatus for following the travel transports. A central arrangement of RFID comprises of two essential segments: The peruse circuit and tag, subtleties of which are talked about later. The utilization of RFID has an extraordinary use as it is viewed as a fundamental piece of ordinary movement. It refers to a global network framework, conjoining physical and virtual objects

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through taking advantage of data capture and communication potentials of identifying objects will be a humongous task in advance of usage and RFID in PTS can be deliberated a step towards implementing.

The planned system mainly acts to bring out the reliability among various bus agencies that will complete in uniform access of passengers in daily rides through an computerized server being updated every single time the passengers travel by carrying the RFID based tickets.

A QR code stands for "Quick Response" and is used as a mobile phone readable code. A barcode is a optical label that contains information about the item to which it is attached and the details are stored in a separate database with the passenger Information.

It is also known as hypertext link which just encodes a URL into the QR code and the scanner application in the mobile phone is pointed towards it. If the device has a QR Code decoding app installed on it, it will open up in the browser and its automatically redirected to that URL.

PROPOSED SYSTEM:

In this paper we introduced a smart bus card ticket system using QR code in android application which is user friendly. Now the conductor can scan the QR code in the smart card by the application. The Generated Fare gets deducted from the centralized E-wallet Database.

Which is generally monitored and maintained by the head of the Ministry. Here each and every Data's are Answerable to Government records. We have also added some additional features which includes the use of a buzzer within the Conductor application. The technology used is based on where the passenger must buy the tickets within the stipulated time otherwise the buzzer goes off with a beep sound and he must buy the ticket as soon as possible and the conductor can cross check with his records and if frauds if found, fine can be imposed immediately. Another benefit of this system for passengers who do not travel daily, is the alternate cashless cards which are prepaid and can be used just like the Local Train Smart Cards.

The minimum refill of these cards is Rs.100. A Benefit of this cashless cards is obviously the time saving feature which occurs with the hurdle of getting exact change of fares. E-ticket issued is all same, and additional details about balanced amount inside this cashless card is printed along with journey details.

The database has all the details related to the specific person and by scanning the QR code it gets validated and the details are displayed on a separate page inside the app. He can view his balance and also can load money into his E-wallet. The database is programmed using SQL (Structured Query Language).

About card recharge, just like Pre-paid passes, refill of this cashless cards can be done at any of the bus depots / online using your Credit / Debit cards. Some of the very important benefits of Automations Cashless transactions, Real Time Data available for decision making. Eco-Friendly, saving time, and cost of overall infrastructure used during old ticketing system.

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SOFTWARE DESCRIPTION:

Programming utilized in this venture is JAVA actualized in android studio. Java is a broadly useful PC programming language that is simultaneous, object arranged and class based. The linguistic structure of java is profoundly affected by C++. Java was particularly worked for item situated programming. All codes are composed inside classes and each datum thing is an article. Prophet supplies the java stage for use with java. The android SDK is an other programming stage utilized generally to create android applications. The java language is an indispensable part in android innovation.

SIMULATION ANALYSIS:

ETM machine

The Electronic Ticketing Machine (ETM) is a Hand Held Computer, in which the program is stored along with all the relevant data, for issue of tickets in the bus during the journey. The storage of program and data is done through a Personal Computer (Host PC), and is called pre-journey configuration for the specific route, bus service, fare.

Wi-Fi Module

The ESP8266 Wi-Fi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

Handheld Device (Mobile Phone)

The main requirement used here is the mobile phone as it contains all the necessary modules inside it. Typically, a smartphone is used as a QR code scanner. Users with a camera phone equipped with the correct reader application can scan the image of the QR code to display text, contact information and connect to a database. An active internet connection is also required to send and retrieve data from the database. Users may receive text after scanning QR codes.

Smart Card: The smart cards are directly related to the volume of information and applications that are programmed for use on a card. A single contact/contactless smart card can be programmed with multiple banking credentials, medical entitlement, driver's license or Qr codes embedded cards. Here, the smart card is issued by the transport commity to each user and they have to recharge it with minimum amount.

Data Entry In Database: The process of entering data into a computerized database or spreadsheet or a SQL server. Data entry can be performed by an individual typing at a keyboard or by a machine entering data electronically. Here, the details of the passenger along with the prepaid amount details are stored in a database.

Authentication: It might involve confirming the identity of a person by validating their identity particulars. Here, the module checks the specific user's account for sufficient amount loaded in his smart card.

Deduction of Amount: Here, the module checks for balance amount in user's wallet

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and deducts money accordingly with the ticket amount.

Printing of Receipt: A receipt is a document acknowledging that a person has received/sent money for making a certain transaction like purchasing tickets in this case. Here, After deduction of money the module prints the receipt with current date and time for future references

Conclusion

We have analyzed the bus ticketing system with literature review and designed the architecture of the project along with UML diagram, class diagram, ER diagram, sequence diagram, activity diagram, data flow diagram, use case diagram. The modules are identified and described. This paper has introduced a completely robotized, solid, straightforward and helpful framework for ticketing in PTS. RFID cards being reusable are substantially more helpful contrasted with the paper based ticketing framework. These are utilized as all inclusive travel pass card that will permit any transportation on any course. GPS administration alongside web was utilized for the separation estimation and passage count. GPS does not require web so is dependable regardless of whether there's no availability at all spots of movement. Since admission computation is done through web, passage is completely clear and gives no space to confusion. Executing this framework can be viewed as a stage towards IoT. Ground-breaking program calculation can make framework to distribute constant area information in web, guaranteeing time keeping of administrations. Framework likewise holds brilliant guarantees towards various transportation fields, including transportation of school understudies guaranteeing better dimension of security.

9.2 Future Work

This application may be further updated according to the growth of technology related to the latest trend. In future QR codes and login credentials may be replaced by Face Unlock and Fingerprint authentication.

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