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Public Transport Automation Using Smart card with RFID

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Abstract:

Public Transport Automation can be implemented using Smart card along with RFID.Everyone uses the public transport in daily basis.Inorder to make the travelling process more comfortable, we proposed a system.In this system we are using a smart card with RFID instead of existing tickets.The passenger taps his card on the RF reader while entering into and leaving from the bus.The fare is calculated and deducted based on the distance travelled using GPS tracker. The fare is deducted as points from the Smart card of the user.This system is implemented using IOT based web-application.

Keywords **—Internet of Things(IOT),Radio Frequency Identification(RFID),Radio Frequency Reader(RF Reader),Global Positioning System(GPS).**

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I. INTRODUCTION

The most widely used public transport in many countries is bus.But, there are many issues faced by the people and conductor during the travel.This system provides a way to overcome these problems.

Nowadays, usage of RFID has increased randomly.RFID has two components,one is RF reader and the other is RF tag. The RF reader scans the Smart card details and stores the passenger information.The Smart card contains details of passenger such as name, contact number, address, profile picture etc. The distance travelled can be calculated with the help of GPS tracker.

II. LITERATURE SURVEY

Literature survey is carried for our guidance to implement the project. Survey is used throughout the whole project inorder to gain knowledge about the techniques and methodology used.The source of literature survey are books, thesis, journals, conferencepapers, and other online tutorials. This paper focuses on overcoming the drawbacks.

A. Existing System

Every bus will have a conductors, he will be collecting the money from the passenger and then issues the printed tickets. This requires the passenger to carry the money and more amount of paper is used to print the tickets. The fluctuations of the ticket fare is a major problem. This system overcomes these problems. It regulates standard fare collection in all buses.

III. PROPOSED DESIGN AND METHODOLOGY

In this system,we have proposed a working system for a secure automated ticketing system in public transport.

B. Proposed Method

Public transport automation system is an Internet of Things (IOT) based fare collection system. This integrated system keeps the passenger flow smooth at peak hours. The data of the passenger will be gathered and transmitted to the server.

C. Design Methodology

This system is aimed for real time implementation of automated fare collection system. The proposed method is simple, efficient, secure and cost-effective.

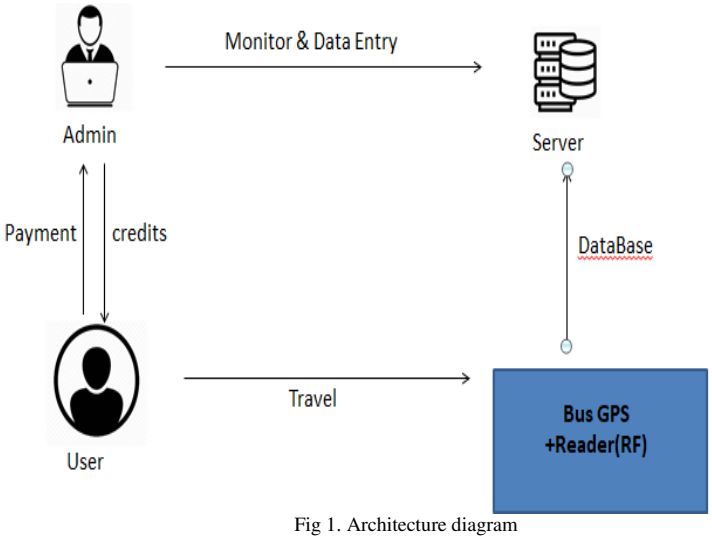

Fig 1. Architecture diagram

Admin collects the passengers details such as name, address, contact number and profile picture. These details are transmitted to the server. The admin constantly monitors the server. The admin checks the profile of the passenger and then issues the smart card to the passenger.

The user after getting the smart card has to recharge his/her card. The amount recharged in the smart card is converted as credit points. The user can now use the card to travel.

The user has to tap the card to the RF Reader while getting into the transport. The Reader then stores the information of the passenger. Then the user has to tap his card again while getting down. The Reader now stores the destination of the passenger. The distance travelled by the passenger is stored in the server with the help of the GPS.

According to the distance travelled by the passenger the fare of travel is automatically deducted from his smart card.

D. Modules

There are three modules in this system.They are Admin module, retailer module and passenger module.

*1)**Admin module:***It allows system administrator to set up back-end of the system and perform basic system configuration, which consists of registration, sign-in and admin page.The RF Reader is a wireless transmitter used to transmit and receive data and controls.

2)***Passenger module:***The passengers scan their details with the help of RF tag provided to them. The GPS device finds the location in latitude and longitude as x and y coordinates. This coordinates are used to find the source and destination of the passenger.

***3)Retailer module*:**Provides the smart card once the user gets registered which helps the user to recharge occasionly.The recharged amount is deducted as points from the users smart card.

E. Hardware Specification

LCD

LCD stands for Liquid Crystal Display .LCD is a flat panel display and it is used in smart phones ,laptops, television and so on .It is used to produce the image visible and it produce the image in notebook and mini computers and it is thinner than the cathode ray tube.

RFID READER

RFID Reader stands for radio frequency identification reader .RFID Reader is used to scan the smart card and produce the information about the individual person or item in the LCD screen. RFID Reader is used to store the information in the RFID Tag through the radio waves.

GPS

GPS Stands for Global Positioning System .GPS is used to track the location of the person in case of emergency purpose. GPS is a portable device which can be accessed

using satellite communication. The tracking purpose is calculated using latitude and longitude positions.

WI-FI

WI-FI stands for wireless communication .it is based on IEEE802.11 which is used for local area network and internet access. WIFI uses radio frequency for communication between devices which are different from walkie talkie ,car radios and weather radios frequencies.

ARDUINO MEGA

ARDUINO MEGA is a microcontroller board .It contains 54 digital input/output pins, 16 analog inputs, 4UARTs, a 16 MHZ crystal oscillator, a USB connection, a power jack, an ICSP header and a reset button

F. Software specification

PHP Stands for Hypertext Preprocessor and it is also known as Personal Home Page. It is a programming language used to design a login page. Admin module which contains username and password to login the web page.This module is used to maintain the passenger database which includes id ,name ,source and destination of the passenger.Passenger module which contains Dashboard, account setting and travel history. In account settings it contains passenger personal settings such as profile pictures ,reset password. Travel history includes the source and destination of the passenger.Retailer module which contains dashboard, recharge and distributed history. In recharge module ,we can recharge the amount in RFID tag .

Fig. 2Example of an arduino mega

Fig. 3Example of a RF Reader

G. Challenges

The most common challenges faced by the systems are explained. In security details of the passenger are prone to eavesdropping which leads to some collude. In scalability, the system will be used by many passengers at a time. Thus it must be scalable for large scale implementation. In case of verification a verifier must be available, to check whether a passenger has paid the fare. In case of efficiency, tapping of smart card must very fast to detect the passenger detail.

Fig. 4 Example of an wifi module

IV. CONCLUSIONS

The existing issues in the fare collection is eliminated.This system is used to digitalize the traditional ticketing system.The security feature provided helps in securing the user information. This project **"PUBLIC TRANSPORT AUTOMATION USING SMART CARD WITH RFID"** is implemented to overcome economical crisis and is helpful for both passengers and conductors.

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