

Smart Ticketing System using Android Application and IOT

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ABSTRACT

In this paper, we are proposing QR reader for bus ticket. Users can scan QR reader instead of ticket. In this app, after registration profile, we have to attach our bank details through in this app. Then whenever we are going on bus, we have to select from and to location. Then it will generate amount details for per head. After that we have to give passenger details. Passenger's details mean count. Then we can scan QR code. So directly money will transfer from our bank details. Then we can get SMS alert for ticket payment proof. Then admin (Conductor) side, they calculate amount details through using web application. Then they can calculate per day amount details for bus ticket information. Then admin can generate per day 3 hours report for checking that crowd condition. In the general way, every bus is controlled by a conductor. The conductor will collect money from each passenger and issue ticket. Initially, printed papers or tokens are used as tickets. Nowadays, handheld machines are used to print tickets. This system has many disadvantages.

General Terms

Ultrasonic sensor, NODE MCU, Android Application, QR code.

Keywords

Internet of Things (IoT), Bus Ticket Management, Global Positioning System.

INTRODUCTION

Physical devices are either designed for the Internet of Things or are assets, including living beings, which are equipped with data sensing and transmitting electronics. Beyond this endpoint

dimension with devices, sensors, actuators and communication systems, the Internet of Things is also used to describe what is effectively done with the data acquired from connected things. Internet of Things (IoT) refers to uniquely identifiable objects and their representation in an Internet-like structure. There are estimates of more than 30 billion devices being wirelessly connected to the Internet of Things by 2020. Also the field of IoT has its own challenges and drawbacks which need to be overcome to realize its full potential. A QR code stands for "Quick Response" and is used as a mobile phone readable barcode. A barcode is a machine-readable optical label that contains information about the item to which it is attached. It also means as "print based hypertext link" which just encodes a URL into the QR code and the scanner application in the mobile phone is pointed towards it. IR Sensors are used for detecting obstacles and for counting people traversing a certain passage or entrance. For example, in commercial buildings there are gates which control user access or presence often used to optimize energy consumption. A counter can be made not only with IR technology but also with thermal imaging systems that use an array of sensors which detect heat sources or using machine vision which usually requires complex image processing algorithms. The distance from the object is very important and in some cases the IR sensor is not suitable for these applications. If the distance from the object is greater than 20 -30cm, the ultrasonic sensor can be a better choice. We need to know when the IR sensor changes its state from HIGH to LOW and count how many times this transition happens: this is called *state change detection*. High end counters use sophisticated hardware for counting process. Our project is a simple objects counter based on Arduino and two IR sensors.

which the first sensor is used to count ingoing people, the second those outgoing.

1. Problem Statement

To develop a easy way of ticket management System which help to shorten the queue and passengers stress for getting a ticket and passengers convenience in general.

2 LITERATURE SURVEY

[1] Jun Zhang discussed the challenge to analyze and predict the passenger flow in real-time. The data input of the system are the GPS trace and smart card payment records. It is built to fuse these two datasets to estimate the passenger flow by deriving the origin and destination of passengers. It has 2 Step Real-Time Prediction model that uses both historical data and recent value to predict the future passenger flow. Compared with existing prediction models that only use historical data or recent value, the proposed 2RT P prediction outperforms them in prediction accuracy in most time and stations.

[2] Dr. Prasun Chowdhurydescribed a smart card technology for ticketing the passengers travelling in bus. The smart card is mainly based on latest Radio Frequency Identification (RFID) technology. For this purpose, an interface is built between RFID setup and driver's mobile phone using a specifically developed Android app "SwipeNgo". The interface helps to send passenger ID from RFID reader to the driver's mobile phone via Bluetooth. The developed "SwipeNgo" app is installed in driver's mobile phone and receives passenger ID from the RFID card reader via interface when passenger get into the bus. Along with the passenger ID, "SwipeNgo" also keep records of the stoppage name/no. into database in mapping with the Global positioning system (GPS) coordinates. The exact fare between source and destination is calculated and deducted from the balance when the passenger gets down from the bus. This information regarding balance is also sent to the RFID setup where the fare is displayed. There is a separate announcement system which alerts the passengers prior to the next halt.

[3] L. Singla described a methodology in which the current position of the bus is acquired by integrating GPS device on the bus and coordinates of the bus are sent by either GPRS service provided by GSM networks or SMS or RFID. GPS device is enabled on the tracking device and this information is sent to centralized control unit or directly at the bus stops using RF receivers. This system is further integrated with the historical average speeds of each segment. This is done to improve the accuracy by including the factors like volume of traffic, crossings in each segment, day and time of day. People can track information using LEDs at bus stops, SMS, web application or Android application. GPS coordinates of the bus when sent to the centralized server where various arrival time estimation algorithms are applied using historical speed patterns.

[4] K. Tanaka described a system, which is used to sense the bus location. This system is a new type of application based on participatory sensing systems. However, it can perform sensing operation without users' operation. Therefore, we can employ the mechanism to realize practical application such as bus location systems. Our sensing system consists of a beacon. device, a smartphone application and a cloud service. The beacon device is installed on a bus to activate the smartphone application. The smartphone application can upload a bus location to the cloud service when the smartphone application detects the beacon device. The cloud service manages the bus location and distributes them for smartphone applications. The demonstration shows a prototype system for a bus location system based on the new participatory sensing mechanism.

[5] J. Gong, there is a approach to predict the public bus arrival time based on historical and real-time GPS data. After analyzing the components of bus arrival time systematically, the bus arrival time and dwell time at previous stops are chosen as the main input variables of the prediction model. At first, the algorithm of data interpolation and processing is designed to get the real-time GPS data as the input variables of the prediction models. Secondly, the statistical model is obtained based on the historical data of average running time of each

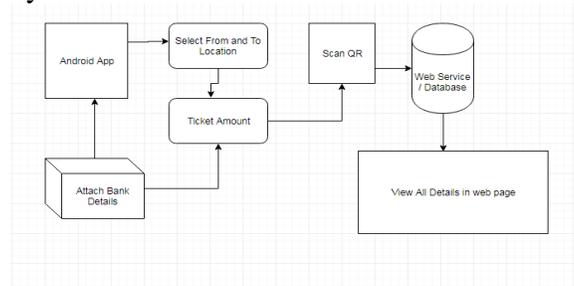
link and dwelling time of each stop at given time-of-day and day-of-week, respectively. Thirdly, a hybrid dynamic prediction model is proposed to predict the bus arrival time. Finally, Actual GPS data from bus route 244 located in Shenyang, CHINA are used as a test bed. The index of Mean Absolute Percentage Error (MAPE) is used to evaluate the three models. The results show that the improved model outperforms the historical data based model in terms of prediction accuracy.

a distributed database that is uploaded to a personal device that is network-connected and user aware.

3 Proposed System

In this paper, we proposed a smart bus ticket system using QR code in android application which is user friendly. Nowadays, Android mobile phones play a major role in the society. IR sensors are placed in the bus in order to get the passenger count. Whenever the user selects the source and destination, the available buses along with the passenger count are provided in the application. After the user enters the number of tickets, the total fare gets generated. Now the user can scan the QR code available in the bus. On scanning the QR code, the generated fare gets detected from the E-Wallet and the ticket will be generated. On the conductor side, the number of passengers travelling in the bus will be displayed. The total number of passengers can be found. Based on the analysis, peak hours in each area will be calculated and many more buses can be let.

The conductor will collect money from each passenger and issue ticket. Initially, printed papers or tokens are used as tickets. For example, if a passenger wishes to travel in bus, he has to carry money with him. Then conductor will collect the money and issue the ticket. This will take more time and waste of human resource as well as energy. In the general way, every bus is controlled by a conductor.



Nowadays, handheld machines are used to print tickets. This system has many disadvantages. The passenger has to carry the ticket till the end of travel and more amount of paper is needed to print the ticket. Even handheld ticketing machine is comparatively slow and needs a trained person to operate it.

4. Hardware Requirements

Arduino Board: It consists of both a physical programmable circuit board and a piece of software, or IDE that runs on the computer, used to write and upload computer code to the physical board.

IR Sensor: An infrared sensor is an electronic instrument which is used to sense certain characteristics of its surroundings by either emitting and/or detecting infrared radiation.

GPS: The global positioning system (GPS) is a 24-satellite navigation system that uses multiple satellite signals to find a receiver's position on earth.

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. The ticket till the end of travel and more amount of paper is needed to print the ticket. Even handheld ticketing machine is comparatively slow and needs a trained person to operate it.

4.1 Advantages

Highly effective and convenient than the normal ticketing system. No cash problems. Reduce paper work and working of machines.

5. CONCLUSION

With this experiment, there will be an increased usage of public transport, as everything can be done independently. There is no need of any dependency on the conductor while entering into the bus for collecting the ticket, all we need to do

is get digitalize by using the scanner available in the mobile device and scan the QR code. This would eventually make people use the transport very often. People need not wait for a long time without knowing when he buses would come, rather they can enter the destination and check for the available buses for their route. Along with the availability the count of passengers travelling in the bus will also be displayed which can be used by the passenger to analyze the crowd in the bus and take the bus accordingly. In case of unavailability of the bus the traveler can opt for another means of transport instead of waiting for a long time. Also, by analyzing the crowd in each bus between particular hours, in case if the crowd in the bus exceeds the number of passengers who can be seated in a bus, then it means some other arrangement had to be made at that particular hour from that source to destination, which can be solved by the transport department.

6. REFERENCES

[1] Arul Das, S.v.k.lingeswaran, "GPS Based Automated Public Transport Fare Collection Systems Based On Distance Travelled By Passenger Using Smart Card", International Journal of Scientific Engineering and Research (IJSER), vol. 2, issue 3, March, 2014.

[2] Y. Chen, T. Kunz, "Performance evaluation of IoT protocols under a constrained wireless access network", 2016 International Conference on Selected Topics in Mobile & Wireless Networking (MoWNeT), pp. 1-IEEE International Conference on Computer Science and Information Technology (ICCSIT), vol. 6, pp. 459-462, 2010 .

[3] J. Gong, M. Liu, S. Zhang, "Hybrid dynamic prediction model of bus arrival time based on weighted of historical and real-time GPS data", 2013 25th Chinese Control and Decision Conference (CCDC), pp. 972-976, 2013.

[4] Jun Zhang, Dayong Shen, Lai Tu, Fan Zhang, Chengzhong Xu, Yi Wang, Chen Tian, Xiangyang Li, Fellow, Benxiong Huang, and Zhengxi Li, 2017,

"A Real-Time Passenger Flow Estimation and Prediction Method for Urban Bus Transit Systems", *IEEE Transaction on Intelligent Transportation Systems*, Volume: 18, Issue: 11, pp: 3168-3178, Nov 2017.

[5] Dr. Prasun Chowdhury, Poulami Bala, Diptadeep Addy, Sumit Giri, Aritra Ray Chaudhuri, "RFID and Android Based Smart Ticketing and Destination Announcement

System", 2016 International Conference on Advances in Computing, Communications and Informatics (ICACCI), pp. 2587-2591, 2016.

[6] L. Singla, P. Bhatia, "GPS based bus tracking system", *Computer Communication and Control (IC4) 2015 International Conference on*, pp. 1-6, 2015.