

## **Original Research Paper**

Engineering

# INTELLIGENT BUS TRANSPORTATION SYSTEM

# DANUSHA PG Scholar, EMBEDDED SYSTEMS, ANURAG GROUP OF INSTITUTIONS, TS, INDIA SAI KRISHNA K Assistant Professor, Dept. of ECE, ANURAG GROUP OF INSTITUTIONS, TS, INDIA

ABSTRACT This paper presents an automated system for ticketing in the Public Transport System (PTS) which is based on passenger identification. This is a user friendly system, which will automatically identify the passenger and deduct the passenger's fare according to the distance travelled. The Radio Frequency Identification (RFID) card and GPS are used to make the identification of passenger and transaction very precise. The cards being reusable, they are much more convenient compared to the paper based ticketing system. RFID cards are distributes among the public. The unique ID in the RFID cards are stored in a database in the internet along with personal data and creates accounts for each person. By accessing this database, it is thus possible to identify the traveller, check his account and deduct the fare from his/her e-wallet.

### KEYWORDS : RFID, GPS, Web-Application

#### INTRODUCTION

The user friendly automated ticketing system suggested in this paper will not only automatically deduct the passenger's fare according to the distance travelled but also detect the passenger's identification. This is possible by use of RFID cards and GPS and can be used to make the transaction and travelling very precise [2]. This paper basically deals with the identification and ticketing of the passengers travelling by the bus.

RFID has been an emerging technology in recent years. RFID technology can be effectively employed in number of applications due to its efficiency. As for its application, it's been a widespread tool for both tracking the transit transports. A fundamental system of RFID consists of two primary components: The reader circuit and tag. The usage of RFID has a great advantage as it is considered to be an integral part of IoT [3]. 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.

#### The main objectives of the project are:

- I. Automatic Fare collection System and updating the information to the cloud.
- II. GPS co-ordinates continuously update to know location of the bus.
- III. WI-FI wireless transmission.
- IV. User can register and login to know fare details, accuracy wallet and make easy travel.
- V. Information of bus's availability is shown on clustered maps.
- VI. Providing data analysis to the Admin about the transportation.

#### **INTERNET OF THINGS**

The Internet of Things (IoT) is an important topic in technology industry, policy and engineering circles and has become headline news in both the specialty press and the popular media. This technology is embodied in a wide spectrum of networked products, systems and sensors which take advantage of advancements in computing power, electronics miniaturization and network interconnections to offer new capabilities not previously possible. An abundance of conferences, reports and news articles discuss and debate the prospective impact of the "IoT revolution"—from new market opportunities and business models to concerns about security, privacy and technical interoperability.

IoT systems like networked vehicles, intelligent traffic systems and sensors embedded in roads and bridges move us closer to the idea of "smart cities", which help minimize congestion and energy

consumption. IoT technology offers the possibility to transform agriculture, industry and energy production and distribution by increasing the availability of information along the value chain of production using networked sensors. However, IoT raises many issues and challenges that need to be considered and addressed in order for potential benefits to be realized.

#### HARDWARE COMPONENTS

- I. Arduino Mega2560
- II. Arduino UNO
- III. Node MCU (ESP8266-12E)
- IV. RFID Reader
- V. GPS
- VI. Servomotor
- VII. LCD Display

#### **PROPOSED METHOD**

To travel more conveniently, this project has presented a fully automated, reliable, transparent and convenient system for ticketing in PTS using RFID cards. RFID cards being reusable are much more convenient compared to the paper based ticketing system. These are used as universal travel pass card that will allow any transportation on any route AS shown in FIG [1].Smart cards can provide identification, authentication, data storage and application processing. These smart cards can be used as passenger identifications. Every passenger carries a smart card As shown in FIG [2]. The smart card has the information such as user identification number, available balance and status register [2].

GPS service along with internet was used for the distance measurement and fare calculation [2]. GPS does not require internet so it is reliable even if there's no connectivity at all places of travel. Since fare calculation is done through cloud by generating API keys and provides no more fare confusion As shown in FIG[3]. Database for travelers were created and accessed via internet using local host web-page. Implementing this system can be seen as a step towards IoT.

#### SMARTBUS



Fig 1: Working Principle of Intelligent Bus Transportation System

#### Volume-6, Issue-4, April - 2017 • ISSN No 2277 - 8160

#### IF: 4.547 | IC Value 80.26

#### SOFTWARETOOLS

- I. Arduino IDE
- II. Web Application

#### I. Arduino IDE

Arduino is an open-source prototyping platform based on easy-touse hardware and software. The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuine hardware to upload programs and communicate with them.

#### **II. Web Application**

Webpage is a client side and server side coding. Client side coding is used to design frontend of web page it involves following languages.

- 1) HTML
- 2) Jquery
- 3) Server side

#### RESULTS

1. The passenger when boarding into the bus, by showing RFID card to the RFID reader it takes the data of passenger name and GPS location (source).



#### Fig 2: Passenger boards the bus

2. when passenger un-boarding from the bus, by showing RFID card to the RFID reader at exit it gives the data like passenger name, destination and fare amount.



# Fig 3: Passenger un-boards the bus CONCLUSION

A fully automated, reliable, transparent and convenient system for ticketing in PTS. RFID cards being reusable are much more

convenient compared to the paper based ticketing system. GPS service provides location of the bus with latitude and longitude points was used for the distance measurement the passenger travelled.GPS does not require internet so is reliable even if there's no connectivity at all places of travel but to update data to the cloud for the calculation of fare amount it uses Wireless transmission Wi-Fi module. Since fare calculation is done through cloud, it provides accuracy wallet which is secure and make travel easy.

#### REFERENCES

- [1]. "Automated Fare Collection System for Public Transport Using GPS" International Conference on Engineering Technology and Science (ICETS'14) ArchanaMala.JJIRSET.
- [2]. "Conductor less Bus Ticketing System Using RFID and Accident Information through GPS and GSM" T.Manikandan, PG.Kalaiyarasi, IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 9, September 2015.
- [3]. "GPS based Automated Public Transport Fare Collection Systems Based on Distance Travelled by Passenger Using Smart Card" Arun Das. S. V, K. Lingeswaran. International Journal of Scientific Engineering and Research (JJSER), Volume 2 Issue 3, March 2014.
- [4]. Suresh Sankaranarayanan, Paul Hamilton (2014). "Mobile Enabled Bus Tracking and Ticketing System", IEEE trans, Vol.13(9), pp.768-775.