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# HARDWARE IMPLEMENTATION OF AUTOMATIC BUS FARE TICKET COLLECTING MACHINE

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***Abstract*-**In India, the most widely used public transport system is bus. Standing in long queues at bus stands, quarrelling with conductors for trifle matters make the journey uncomfortable for the passengers. It has been proposed a thought for implementing open-end credit technology for ticketing the passengers travelling in bus. Automatic Fare Collection System implemented by RFID /Smart card. RFID card is given to the passenger and when passenger gets into the bus he has got to swipe the cardboard within the RFID reader and he has got to a destination point within the device will automatically calculates the fare and deduct the cash automatically .Hence people don't need to carry the cash and that they don't have the matter in giving the right change to conductor. Conductor also feels free in collecting the cash from the people. All the record will updated automatically within the server continuously. When more people are travelling than it's also easy to give the ticket. A web-page monitors the bus for amount path taken bus status number of passengers distance information. It overcomes all the issues faced in bus with IOT based web-page monitor system. The main idea behind this project is to gather the fare automatically using the web of Things during a cost efficient manner

**Keyword:** Internet of Things (IOT), Network Security, Radio Frequency Identification (RFID), Server, Web-page monitor

## I INTRODUCTION

Automated fare collection (AFC) systems are utilized in many urban conveyance systems round the world. As the designation suggests, these are typically designed with the precise purpose of automating the ticketing system, easing conveyance use for passengers and adding efficiency to revenue collection operations. In addition, AFC systems are wont to enable integrated ticketing across different public trans- port modes and operators in urban areas. This chapter gives you an introduction about the Internet of Things and its real time applications. The main idea behind this project is to gather the fare automatically using the web of Things during a cost efficient manner. Internet of Things allows objects to sensed and controlled remotely across existing network infrastructure

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## II LITERATURE REVIEW

Literature review was carried out for the whole project to gain knowledge and to improve the skills needed to complete this project. The main sources for this project are previous project on the same basis , research thesis, books, journals and online tutorials. This chapter mainly focuses on the basic concepts and all fundamental theories which are related to this project and the drawbacks of the current system.

## III EXISTING SYSTEM

In 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. The passenger have to carry the ticket till the reaching their stopping, the conductor should ensure that everyone has got the ticket, the time taken for ticketing is comparatively more and more amount of paper is required to print the Ticket.

## IV PROPOSED METHODLOGY

In our proposed system, we are implementing a technique for smart bus fare collection. Here we are using RFID tag as the smart card, once the tag reads by the reader then the controller will display 3options in the LCD like 1) recharge 2) travel and 3) balance and you have choose the option using keypad.For example, if you choose travel then the controller will ask for the start and stop point and which can be select by the keypad and the amount will be automatically detected from the account and the notification message will be sent user using IOT. And all status will be updated in the webpage for future reference using IOT module and will be displayed in the LCD for user reference.

## V DESIGN METHODOLOGY

This project implementation is aimed at a real time usage of Automatic Bus Fare Collection and does not compromise on the security. It guarantees us that the proposed project is simple, efficient and cost effective.

### *A) Methodology*

RFID has been an emerging technology in recent years. RFID consists of two components ,RFID Tag and RFID Reader. RFID Tag contains information such as name, address and mobile number. RFID reader reads the above information's from the RFID Tag. The IR sensor is used to count the number of persons entering into the bus. Internet of Things define the concept of network devices to sense and collect data from the world around us, and then share that data across the Internet where it can be processed and utilized for various interesting purposes.

### *B) Internet Of Things(IOT)*

The Internet of things (IOT) is the network allowing information exchange to and from that thing. Be it light bulbs, toasters, refrigerators, flower pots, watches, fans, planes, trains, automobiles,

or anything around you, a touch networked computer are often combined with it to simply accept input. The Internet of things (IoT) may be a system of interrelated computing devices, mechanical and digital machines given unique identifiers (UIDs). Hence, the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction IoT technology is most synonymous with products pertaining to the concept of the "smart home", covering devices and appliances.

## VI HARDWARE COLLECTION

### *A) AURDINO MEGA*

Today, Arduino is an open source hardware and software company, project and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects which will sense and control objects within the physical and digital world.

*Fig.1 Arduino Board*

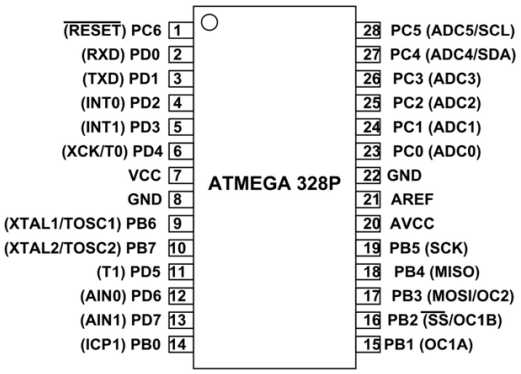
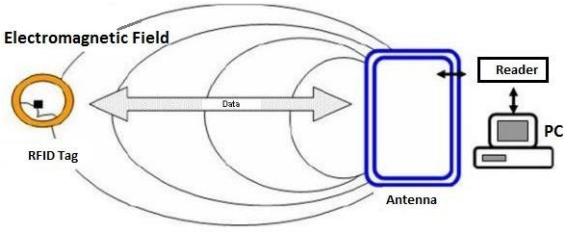



Fig.2 *Pin diagram of Controller*

Arduino Uno may be a microcontroller board supported the ATmega328P. It has 14 digital input/output pins (of which 6 are often used as PWM outputs), 6 analog inputs, a 16 MHz quartz , a USB connection, an influence jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller, simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to urge started. You can tinker together with your UNO without fear an excessive amount of about doing something wrong,worst case scenario you can replace the chip for a few dollars and start over again. ATMEGA328P is a 28 pin chip Many pins of the chip here have more than one function

### *B) RFID TECHNOLOGY*

RFID is abbreviation of Radio Frequency Identification. RFID signifies to tiny electronic gadgets that comprise of a small chip and an antenna RFID (radio frequency identification) is a technique facilitating identification of any product or item without the need of any line of sight amid transponder and reader. RFID Structure is continuously composed of two main hardware components. The transponder which is found on the merchandise to be scanned and therefore the reader which may be either just a reader or a read & write device, depending upon the system design, technology employed and the requirement. The RFID reader characteristically comprise of a frequency module, a controlling unit for configurations, a monitor and an antenna ti investigate the RFID tags. In addition, variety of RFID readers are in-built with an additional interface allowing them to forward the info received to a different system



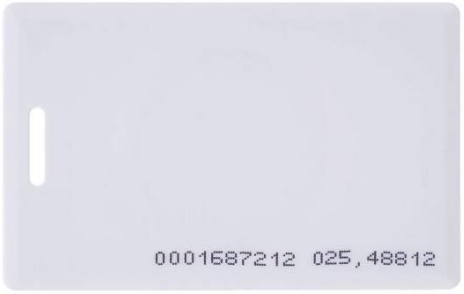



*Fig.3 RFID Technology* *Fig.4.FID Tag*

***1)RFID Tag***

RFID tags are a kind of tracking system that uses smart barcodes so as to spot items. These radio waves transmit data from the tag to a reader, which then transmits the knowledge to an RFID computer virus An RFID tag works by transmitting and receiving information via an antenna and a microchip — also sometimes called an microcircuit or IC. The microchip on an RFID reader is written with whatever information the user wants. There are two type of RFID Tag based on frequency types namely low frequency and high frequency type.

***2) Passive or Active***

Active RFID tags have their own transmitter and power source (usually a battery) onboard the tag. These are mostly UHF solutions, and skim ranges can extend up to 100 m in some instances. Active tags are usually larger and more expensive than their passive counterparts and are used to track large assets In passive RFID solutions, the reader and reader antenna send a signal to the tag, which signal is employed to power on the tag and reflect energy back to the reader. There are passive LF, HF, and UHF systems. Read ranges are shorter than with active tags and are limited by the facility of the radio wave reflected back to the readerPassive tags are usually smaller, less costly , and more flexible than active tags. This means they will be attached or maybe embedded on a wider sort of objects. Passive UHF tags are commonly used for item-level tracking of commodity and pharmaceuticals

***3) RFID Reader***

A radio frequency identification reader (RFID reader) is a device used to gathering th e information from the RFID tag, which is used to track individual objects. Radio waves are wont to transfer data from the tag to a reader. RFID may be a technology similar in theory to bar codes. The RFID tag it must be within the range of an RFID reader, which ranges from 3 to 300 feet, so as to be read. RFID technology allows several items to be quickly scanned and enables fast identification of a specific product, even when it's surrounded by several other items.

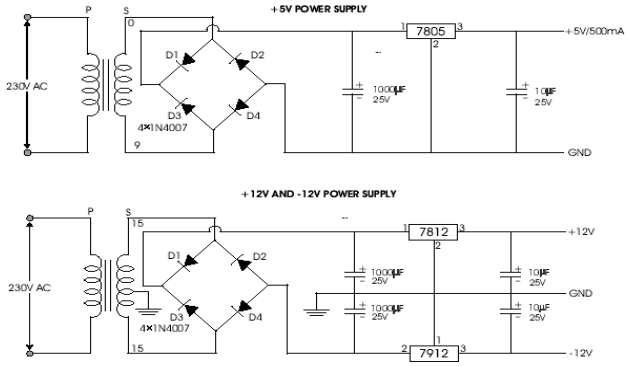




*Fig.5 RFID Reader* *Fig. 6 Power Supply*

***4) LCD***

The most commonly used Character based LCDs are supported Hitachi's HD44780 controller or other which are compatible with HD44580 Most LCDs with 1 controller has 14 Pins and LCDs with 2 controller has 16 Pins (two pins are extra in both for back-light LED connections). LCD, or Liquid Crystal Display, is the fundamental display technology.They are thinner and lighter and draw much

less power than cathode ray tubes.Mostly LCD Work on the principle of blocking light rather than emitting it.Only the instruction register (IR) and the data register (DR) of the LCD can be controlled by the MCU The internal operation of the LCD is determined by signals sent from the MCU The signals are register selection signal (RS), read/write signal (R/W), and the data bus (DB0 to DB7),

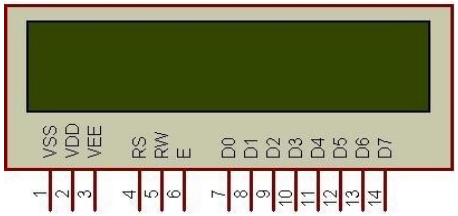



*Fig.7 LCD*

***5) Power Supply***

Almost all basic household electronic circuits need an unregulated AC to be converted to constant DC, in order to operate the electronic device. All devices will have a certain power supply limit and the electronic circuits inside these devices must be able to supply a constant DC voltage within this limit. That is, all the active and passive electronic devices will have a particular DC operating point (Q-point or Quiescent point), and now must be achieved by the source of DC power. The best method used is within the sort of an unregulated power supply –a combination of a transformer, rectifier and a filter.

## VII SETTING OF PROJECT

### *A)SETTING OF HARDWARE*

The hardware sample use different wiring. Micro- controller contains full implementation of a typical microprocessor. Light emitting diode used for displaying information about the ticket processing A wireless Wi-Fi adapter connects a computer without wireless hardware to a wireless network by transmitting a Wi-Fi The adapter receives signals from a wireless router or other wireless devices. There are three module has been implemented during this hardware sample. First module is meant for recharging amount in RFID. We can enter what proportion amount we would like by paying the cash


*Fig.8 Output*

Second module designed for entering the traveling details. we want to enter the starting and destination place supported that the travelling distance are going to be calculated and amount are going to be extracted from the open-end credit . Third module is checking for balance in our RFID.

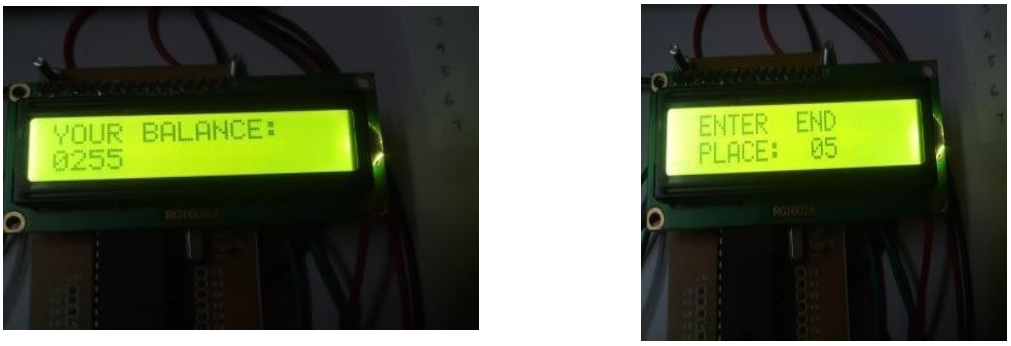



*Fig.9 Output*

### B) *SETTING OF SOFTWARE*

A PHP means Hypertext Preprocessor (PHP) is a programming language that allows web developers to create a dynamic web page .login from which requires admin name and password. In this proposed system we are using Adobe dream weaver software for generating the website. Adobe dream weaver may be a proprietary web development tool and it's a neighborhood of cloud. Adobe dream weaver is the all-in-one visual development tool for creating, publishing and managing the websites The php code has two module one is view buses and another one is logout. when we will click view buses it will show all bus images .logout option is used to exit from the admin web-page. Each bus have separate hardware sample for automatic bus ticketing. Wi-Fi The adapter receives signals from a wireless router or other wireless devices and it translates the signal, therefore the person can access the web at any time they are in range of a Wi-Fi hot- spot or wireless network. PHP provides mysql connect function to open a database connection .The passenger and bus details have to be maintained by mysql database All the details will be updated automatically by using network Passenger details has the details of passenger id, name, starting place and destination place and how much amount required for travelling and details of balancing amount

## VIII CONCLUSION

The fare collection problem has been eliminated Moreover, the project phase i s completed successfully by using smart card .This project is made with pre-planning, that it provides flexibility in operation. This innovation has made more desirable and economical. This project "SMART AUTOMATIC BUS FARE TICKET COLLECTING MACHINE " is meant with the hope that it's considerably economical and helpful for passengers and also as conductors during Journey

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