

## Bus Tracking System using RFID

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**Abstract**— The Project has aim for bus tracking system using RFID to make it feasible for people. Public transportation in many countries is being used as a means of transport for travelling and accordingly people would prefer these public transportations to be scheduled properly, on time and the frequency be increased for commuters to make good use of it. It has been found that quite an amount of research work has been carried out, in this sector, by way of using RFID technology in the public transportation systems towards the tracking of Bus arrival and departure time. In addition, research has also been carried out in using RFID TAGS for tracking of buses along with RFID technology at traffic lights, bus stops and displaying expected arrival times on LCD screen at bus stops along with their current positions.

**Key words:** RFID, GSM Modem, LCD

### I. INTRODUCTION

In today's world transportation system has a very a vital role to play in day to-day life. Most preferred transportation system by the people is bus system. Because of the ever-increasing development the requirement of this system is increasing day by day. The number of busses running daily is huge. To keep track of all the busses is a big challenge before the bus authorities. To solve this problem, we have come up with a novel solution of city bus tracking here as soon as the bus comes near the bus stop it transmits its own identity (ID) to the bus stop reader. The bus stop reader then sends the bus identity (ID) to the master terminal. On the master terminal, we have a pc which will indicate the position of bus graphically on visual basic software.

### II. OBJECTIVE

- 1) To develop the bus system which will ensure the passengers exact timing of the bus to reach the stop.
- 2) This will ease the current bus system in the cities for passengers.
- 3) To make the bus system more feasible to the passengers.
- 4) To develop the bus system more advanced and convenient to the people.

### III. SCOPE OF THE OBJECTIVE

In many cities people face the problem of bus timing due to constant change in the bus timing and delay in bus facilities. This happens due to traffic jam in cities or breakdown of the bus, so to overcome this problem we have generated a system which ensure the passengers timing of the busto arrive at the bus stop. In this we will develop the system with the use RFID tag on the bus and RFID tag reader on the bus stop. This will help passenger to know the exact timing of the bus to reach the bus stop in that area.

The passenger can easily track exact status of the bus through application or through the SMS services. The basic idea of this project is to reduce the waiting time of the commuter on the bus stop. This is done using the RFID

technology. This technology will reduce human errors in the system. The system could be more elaborately for all buses in the city and it will be whole digital network system with least possible errors. The tags are cost efficient and the whole equipment once installed can work without any attention. The area of application using RFID is wide and the technology has already proved its value. Thus, the implementation and practice of such a digital system would always be worth.

### IV. LITERATURE SURVEY

- 1) This idea is emerged from IEEE paper of RFID Based School Bus Tracking System and Security System published by Shraddha Shah and Bharti Singh. In this school bus tracking system, it used the RFID reader for students to monitor the in and out of the school bus. In this RFID reader reads thetag of the students and stored the timing on the website and similar SMS sends to the parents of student. This ensures the safety of students and can track the exact location and route of the schoolbus. There are major problems such as follows are: -
  - a) Non- availability of prior information about the buses arrival.
  - b) Travel time depends on several external parameters.
  - c) Present scenario is of fixed schedules and not intelligent systems.
  - d) Results in costly errors, stress, dissatisfaction and inconvenience.
- 2) This also referred from IEEE paper of A Smart Bus Tracking System Based on Location Aware Services and QR Codes published by Suleyman Eken and Ahmet Sayar in year 2014. In this paper, they proposed smart bus tracking system that any passenger with a smart phone or mobile devicewith the QR (Quick Response) code reader can scan QR codes placed at bus stops to view estimated bus arrival times, buses current locations, and bus routes on a map. Anyone can access these map sand have the option to sign up to receive free alerts about expected bus arrival times for the interested buses and related routes via SMS and e-mails. We used C4.5 (a statistical classifier)algorithm for the estimation of bus arrival times to minimize the passengers waiting time. GPS(Global Positioning System) and Google Maps are used for navigation and display services respectively.
- 3) This is also referred from IEEE paper of "Mobile Enabled Bus Tracking and Ticketing System" Published by Suresh Sankarananraayanan and Paul Hamilton in year 2014. In this paper, they have designed bus tracking system using GPS, RFID, LCD and ANDROID. In this system bus is tracking is done by using GPS device fitted on the bus which will also display the bus route on map and real-time travelling of bus on maps such as google maps. They have used RFID reader and tag for automatic ticketing for passenger. A smart card which would have RFID tag on them would have balance or points on them and RFID reader in bus to read smart card. This smart

card would use for the automatic ticketing for passenger on bus. An android application is done for to track the bus in real time on maps or route in the application. This application would also provide the topping of the smart card of the person.

### V. BLOCK DIAGRAM

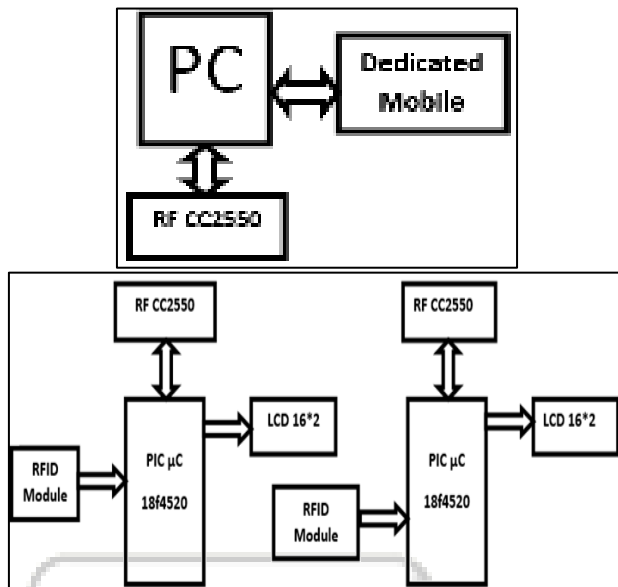


Fig. 1.1: Bus Stop Unit

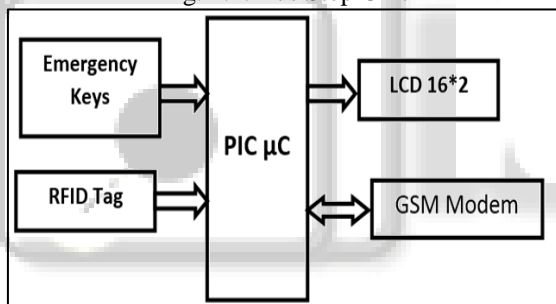


Fig. 1.2: Bus Unit

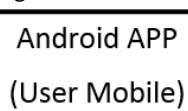


Fig. 1.3: App Unit

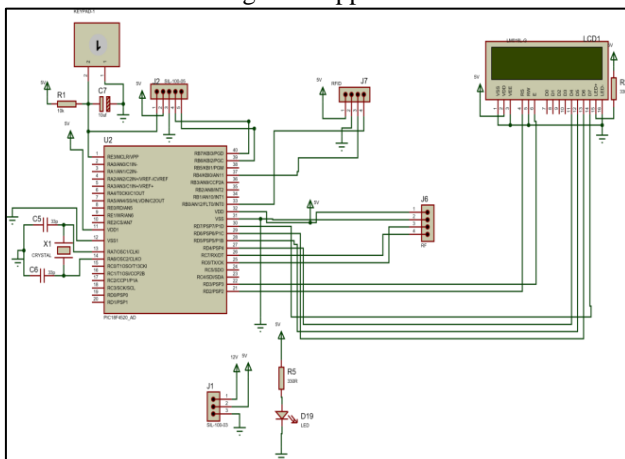


Fig. 1.4: Circuit Diagram

In this block diagram there are two bus stops. We are using two pic microcontrollers 18f4520, two RFID modules, LCD 16\*2, RF CC2550, PC (personal computer) will be considering as our main depot.

Bus will start from main depot unit as the bus leaves the depot its departure time will be stored on the main server. At the next stop there will be displaying the arrival time of the bus on the stop. As soon as the bus reaches the stop, RFID module (reader) will read the RFID tag on the bus and it will generate unique address and data will be send topic microcontrollers 18f4520 and stored the data on the main server of the bus depot unit. The data will send through wireless communication between bus stop and bus depot unit.

The commuter can know the bus arrival time or any changes in bus schedule such as breakdown, traffic jam etc. through the android application. This application will help to know the commuter approximate timing of bus to reach the bus stop. We also have the GSM modem so if the commuter does not have smart phone then commuter can just send SMS to the main server and know the arrival time of the bus on the bus stop.

### VI. COMPONENTS

#### A. GSM Modem

GSM (Global System for Mobile communications). GSM is a digital cellular communications system. It is used for transmitting mobile voice and data services. International roaming capability. Encryption capability for information security and privacy Better security against fraud (through terminal validation and user authentication). A GSM modem is a specialized type of modem which accepts a SIM & operates over a subscription to a mobile operator, just like mobile phone.SIM900.



Fig. 1.5: GSM Modem

#### B. RFID

RFID Reader: -It sends an electromagnetic wave which carrier a signal to identify objects. Then the reader receives the information returned by these objects.

RFID Tag: -It is attached to these objects, react to receiving the signal sent by the reader in order to forward to it the requested information.

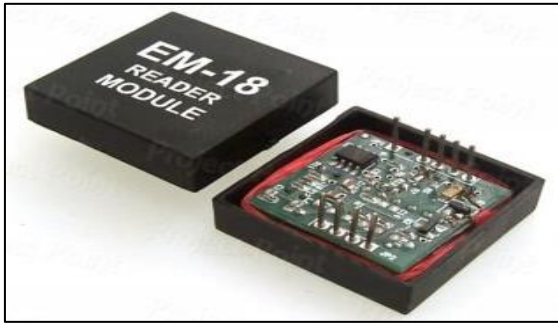


Fig. 1.6: RFID MODULE

## VII. CONCLUSION

- 1) This app will not only give location of bus but also the destination of the bus can be detected and it more feasible in nature for passengers.
- 2) Thus we proposed the design and development of a low-cost transportation management system based on integration of RFID and GSM.
- 3) User is provided with the service, which gives them the current location information of desired buses.
- 4) The service therefore vanishes the need of waiting at the bus stop and hence it saves lot of time.
- 5) The system is also efficient and beneficial in handling an error and the emergency situations.

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