

## Bus Navigation System with Effective Data Transmission and Wireless Communication

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### ABSTRACT

*It is very important to reduce the passenger waiting time at city bus stops, when the bus time tables are unknown to passengers. In order to reduce the waiting time, passengers would have to obtain live time tables for any bus stop. To achieve this complicated task, we propose a new bus location and navigation system using smart phones by using ICT (Information and Communication Technology). The system is easily retrieve information about bus location by RFID technology. In addition the system also provides shortest walking route to the nearby bus stop. The main problem in the current scenario is the tracking of an organization buses while moving on a highway is a crucial task. A person patiently waiting for the bus may need to enquire about the position of current location of the bus. Mobile phones based bus tracking system provides a solution to this problem which helps anyone to know the location of the bus without calling or disturbing the person travelling in that bus. . It will track the location of the bus where it met with accident and immediately delivers the message about the accident to the emergency services such as ambulance and concerned people without time delay.*

### I. INTRODUCTION

This proposed system developed for overcome and resolve the above faults. The system introduced in this project was specially designed for Educational Institutions buses. There are many paper presented work on the bus tracking system when the new technology got improved a small review of those papers.

Thus monitoring system will run only in the PC with internet connection. This system was developed with the modules such as In-Bus module and Bus-Stand module. The Bus-Stand module will send the status of the bus stand to the In-Bus module. Depending upon the report the driver will takes the decision. Thus status such as, number of passengers in bus stop and inside the bus, ETA (Estimated time of Arrival) and ETD(Estimated Time Departure) are calculated by using IR sensors. This system mainly focused on the public transportation. Thus proposed system will help to detect the position of a failure bus. In order to provide the help in minimum time and also it will provide the short path and route through the GSM messaging service. But thus system was maintained and carried out by only management authority with a good graphical interface. There will be found easy for the passengers, in case some peoples are came from outside places and villages they don't have any internet facilities then they peoples are suffering from this system, in our model we overcome this drawback. This system displays all information about bus timing and

in during traffics delay time also it displays in the bus stop only, so for passenger’s internet is not required but the service provider has to maintain the connection. In future applications we can implement the local languages also. The other thing is display of seat availability like how many seats are empty, this will helps either we have go or wait for another free bus.

## II. LITERATURE SURVAY

As the earlier projects they were done with tracking of the bus and they have developed a software application that is useful only for mobile users and it requires internet also. And someone has developed software for school or College cabs they can track where the vehicle is coming [1].

And in the earlier papers they have implemented tracking using GPS and GPRS services but they are not implement the seat availability and time arrival of the bus [2].

In some paper the location of the vehicle is determined by using Global Positioning System (GPS).The information from the GPS receiver is sent in the form of SMS to the user with the help of SMS user have to track the bus [3].

In our project we developed without internet, and it is not an application it is a module “Bus unit” and “Bus stop unit” using wireless transmission we are transmit and receive the data. Passengers don’t required internet but the service provider should have the internet. To transmit and receive data within long distances. We developed the seat availability in the bus as well as arrival time of the bus and delay time during traffic or some issues.

## III. METHODOLOGY

### 3.1 Bus Unit

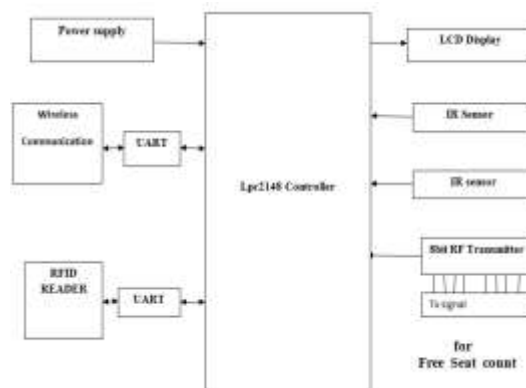


Fig-1:Block diagram of Bus unit

As the block diagram shows this is the architecture of our bus unit which is placed at Bus. It holds some major blocks which handles different work. The supply will be given to the blocks the IR sensors are placed on seat it will detect if the seat is either full or empty and data will be sent to the processor and it will be transferred through UART to wireless device. The data is received by Bus stop unit and it will be displayed to passengers those who are waiting in Bus stop. The RFID reader also placed in Bus when it will reach the bus stop it will read the tag placed in

bus stop. Then it will send the information to the next bus stop also expected arrival time. Here we used the LPC2148 microcontroller it much faster than the other and low power consumption.

In practical monitoring system using GSM module but here we used Zig-bee module for wireless transmission. In the bus module RFID reader, Zig-bee module, IR sensors and one LCD display were placed. When the seat is filled, IR sensor will high it will send high signal to the processor controller LPC2148 it converts analog signal to digital and the data will transferred through Zig-bee to the next bus stop it will be displayed to passengers. In the coding part we developed the all possibilities in case 50 seats are there each probability it will check. Like first seat is occupied other seats are free and two seat then three likely up to 50. Then the other part is when bus enters the bus stop RFID reader will read the “RFID Tag” this information will send to the next bus stop. As well as it displays in bus also who ever are sit in the bus they also know about the bus stop which bus top it is.

### 3.2 Bus Stop Unit

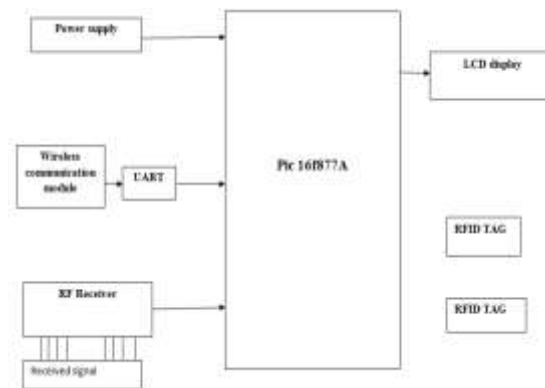


Fig-2:Block diagram of Bus stop unit

In the bus stop unit we have used PIC16f877a Peripheral Interconnecting device (PIC). Here the RFID tag is placed separately and LCD display for monitoring the seat availability and arrival timings. The information transmitted by the bus is received by the wireless communication module and controller will receive through UART then it is displayed on LCD display.

Here the controller we used it has 5 ports like A,BC,D,E they divided and it more efficient and faster. Power supply will be given to this unit its work is to receive the data from bus unit whatever it transmits and information should be displayed on LCD display. Here also one Zig-bee module is placed for reception. The RFID tag is placed separately near the bus stop in coding we assign the name for that particular tag when it reads the tag it will send the assigned name only. Serially the data will be displayed on LCD display.

### IV. RESULTS

It will displays the estimated time arrival and departure. And also it tracks the bus where the is, means exact location of the bus as the fig 5 shown below. As well as it shows how much seats are occupied and how much seats are available. And finally when some traffic or some problem will occurs it notifies the delay time also how much time about to reach the location. These and all features are covered by this both bus and bus stop unit. The fig (3) shows the

bus unit in this LCD display will shows the bus number and exact location of the bus means which bus stop the bus is. And the fig (4) shows the bus stop unit in this unit the LCD display will monitors the seat availability and time arrival of the bus.



Fig-3:Bus unit



Fig-4:Bus stop unit



Fig-5:Full working model

## V. CONCLUSIONS

Concisely, the design adopted a new kind of method, that is to say, MCU combined with RFID module and Transceiver modules to achieve automatic station-report function with buses movement monitoring system. All modules were configured correctly to obtain the most efficient monitoring frame work. It can carry on the effective management to the public transportation vehicles in the most convenient way to the suffered passengers. It has many expandable functions, with considerable prospects for putting it on the market. After testing and modifications for about half a year, the system tends to be much stable and played an important role in dispatching buses and commanding public transit operations. With few workload of processing, this technique is quite feasible.

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