

# Bus departure indication and auto announcement system in bus stops, useful in rural bus stops

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## Abstract :

In present bus transportation system we need one person in each bus station to enter the data of busses arrivals timings and the driver or conductor has to get down the bus to enter the timings for confirmation but this is a time consuming process and needs lot of man power to implement in many bus stops. And sometimes some busses will not stop in particular stops even though they have to stop because of this passengers have to face problem especially in the night time. To make this process fast, automatic and to reduce manpower and also to avoid missing stops we are implementing this project. This can be achieved easily with help of advancement in technologies. Now a day's so many technologies are coming out to make our lives more comfort, user-friendly and secure. This is a complete stand alone attendance system in which we store all busses arrival timings with time and date in excel file which will be created on SD card using Arduino microcontroller.

Key Terms: Aurdino microcontroller, RFID, SD memory card, Embedded systems

## 1. Introduction:

The world is changing at a rapid pace, driven by technological innovation which reshaping the world faster than ever before. The fast development of innovation and hardware had changed our life from the most essential errand of flicking the change on to the most muddled assignment of substantial machining. Today's cities have become increasingly automobile-dominated where everyone is rushing to reach their destinations, which leads to in transport-related challenges such as public transport weakening, congestion and accidents. Efficient and reliable public transport is essential to economic growth of urban where for the majority of people, the public transport is the main means to access employment, education, and public services. Therefore, for those people who always rely on the public transport in their life, they mostly concern about the real time location of the bus which they are waiting for and the time it will take to reach the bus stop. By knowing the time taken to reach, they can make better travelling decisions. Furthermore, bus tracking and monitoring system for the school bus, provide the safety for the students that enable the parents and school authorities to track the location of the bus as well as the authorities can be able to monitor the speed of the bus to assure that the driver is not in danger driving due to the dearth of research in tracking and monitoring

systems. This paper developed a real time public transport tracking and monitoring system using RFID module.

## 2. Literature survey:

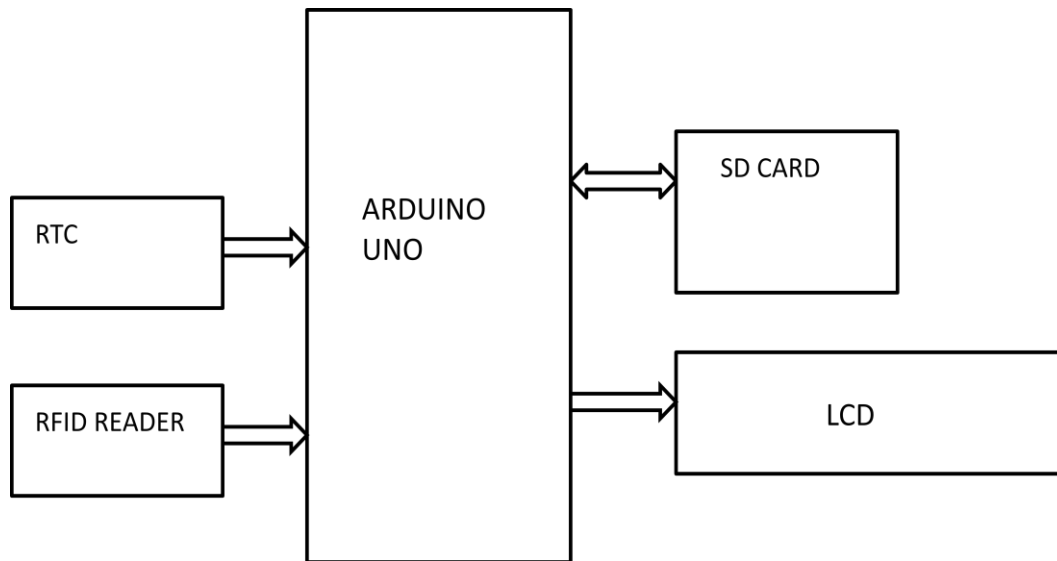
In 2006 review merging bus route for obtained proper bus scheduling model in central business district. Where, a significant portion of the 200,000 people working in central business district (CBD) relies on buses as their primary means of transport. Duration peak-hour traffic demand of passengers is higher and buses are overcrowding. They proposed a merging bus routes method for reduce traffic congestion problem with increasing bus occupancy in central business district. They review overlapping of bus routes and fleet size. Also, they obtained rate of passengers in different operation time during day. They by merging routes which they have more than 60% overlap obtained a new method for bus operation. The proposed method could decrease fleet size and the number of bus stopping activities. Also, for tranquility passengers, frequency increase and reduction travel time. Furthermore, they review pros and cons of route merger from three point of view. By summarizing the pros and cons, we can see that the benefits of the route mergers outweigh the drawbacks.

Pros	Cons	Traffic and society	Reduction in bus trips and bus stopping activities	Relief in traffic congestion and air pollution	Savings in land that is used as bus terminus	Bus operators	Service extension from bus trip saving	Operation cost from adoption of the truly distance-based fare	Reduction in number of buses needed	Difficulty on managing long route	Expansion of network	Minimal negative effect to passenger demands	Passengers	Reduction in waiting time	Use of smart card during exiting	Inconvenience from change of service	Possible slight increase in travel time by boarding and alighting	More packed buses
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In 2002 a scheduling model based on interrelationship between passenger trip demands and bus trip supplies for inter-city bus carriers have been studied by Yan and Chen. They achieved by adjustment frequency of buses could decreasing journey time and fleet size. They also found by adjustment frequency of buses duration peak-hour traffic can reducing operating cost. Also, van Oudheusden and Zhu in 1995 have proposed a trip frequency scheduling for determination of trip frequencies problem which this way reduced trip frequency duration different period. They achieved that overcrowding of buses can depend by insufficient planning in addition fleet size and traffic congestion (van Oudheusden and Zhu 1995). In 2009 Chen et al. analyzed bus operation reliability at the stop, route and network levels. They achieved by increasing distance between a bus stop and the origin terminal, reliability of bus service will be declined. Also, bus service reliability greatly decreases when this distance to increase to more than 30 km (Chen et al. 2009). in 2010 considered a real-time scheduling method for a variable-route bus. The proposed method was consideration on both the cost and the passengers. This model reduced cost and average waiting time of the passengers.

### 3. Existing technology:

The Sri Lankan government focuses only on highway construction the transportation sector but monitoring under the proper mechanism is also crucial to sustain. Bus movements are monitored and recorded by the time-keepers available at the main bus-stands in main cities. These time-keepers keep records about arrival and departure buses from the Stand. But many villages do not have the bus stops and only they have passenger halts/shelters. The rest of the huge road was not monitored using proper mechanism. The manual system could have the chances to get the improper recording because of human errors, also this paper based system is worthless in many occasions. These records are not helpful anymore to passengers as well.



of the GPS module installed into it and the module is kept active by giving po  
Architecture for Real time information

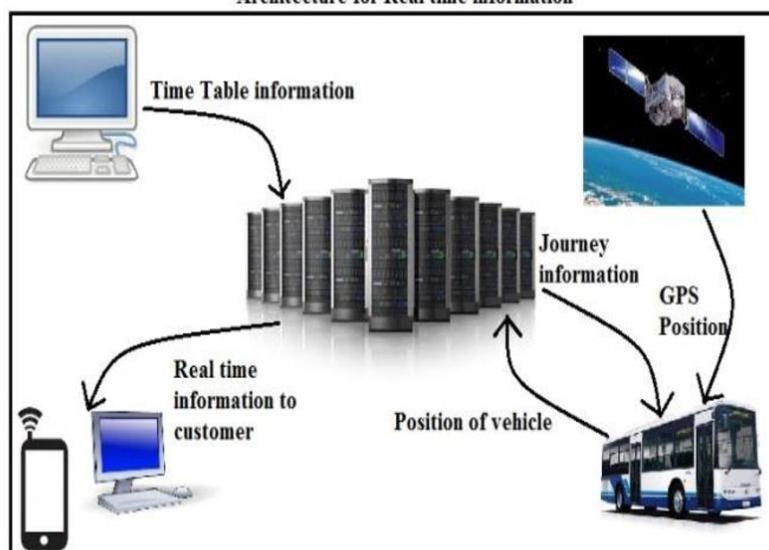
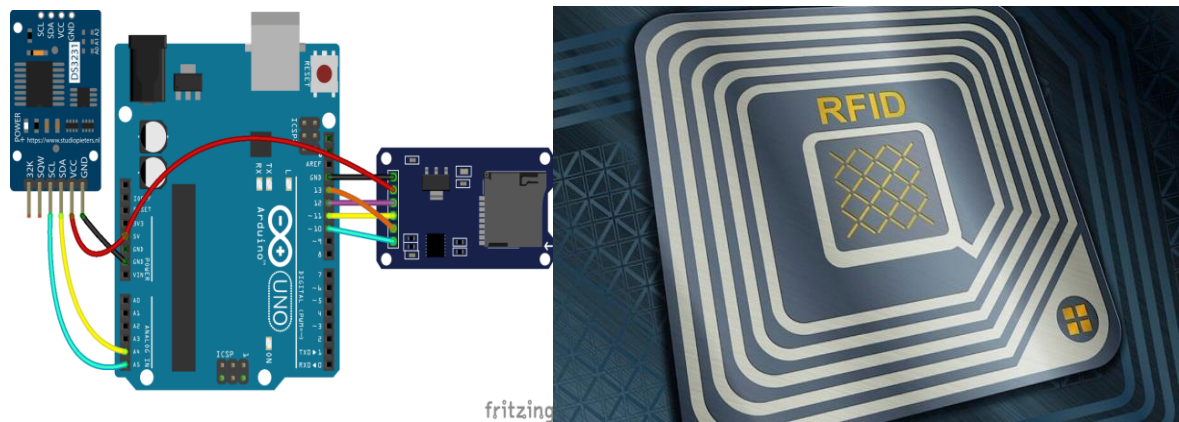


Fig. 1: Architecture.

### 4. Proposed techniques:

The proposed bus scheduler basically has the two major part. One is web based interface system, second is sensing unit. Here along the road, there are number of bus halts hut which will consist RFID reader and have serial connection with Arduino. Arduino will provide the identification processing power to RFID reader. The reader will sense the tag’s data from font unit and departure of the bus from on the platform, which will be transferred with the timestamp and ID over the GPRS by the GSM/GPRS shield to Central bus scheduler. Over the Internet, anyone can access the bus movement details for their personal usage. Bus units will have the two parallel active RFID sub units, one in the front and second in the back side. When a bus arrives into any platform the RFID reader will recognize the vehicle and it will produce with the timestamp to system coordinator. Also while the bus leaves from the platform the rear will be identified by the reader located in the bus stop. These data will be transferred to the central scheduler over the same Internet. The record keeping can be reviewed by the authority and also other kinds of users coming under the user pool, the proposed system.



```

digital_energy_meter_reading_with_gprs_and_gsm
File Edit Sketch Tools Help

digital_energy_meter_reading_with_gprs_and_gsm
#include <LiquidCrystal.h>
#include <OneWire.h>
#include <EEPROM.h>

LiquidCrystal lcd(4,5,6,7,8,9);
OneWire myOneWire(12); // PC, D0
int light1=10;
int light2=11;
int signal=2;

unsigned char payment=1,units=0, pulsecount=0,s;
int tempdisplay,incoming;

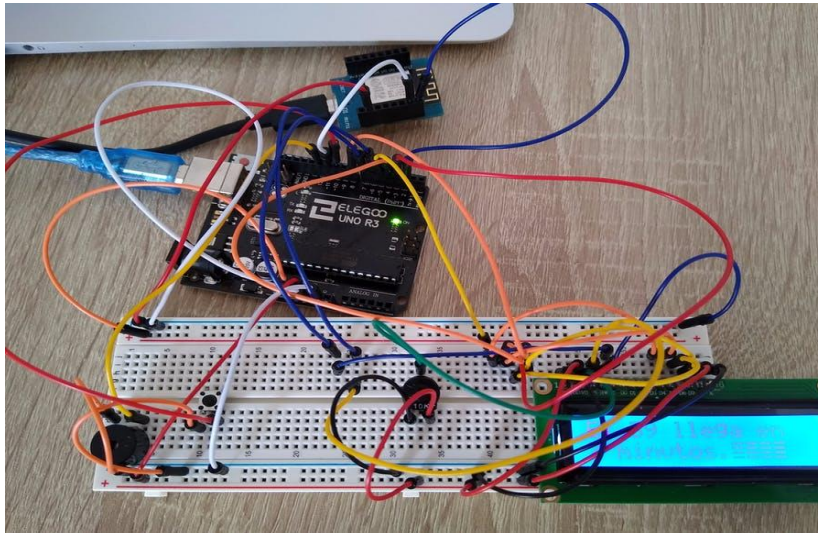
//float gas = 0;
//float gas_lit = 0; //2RD that switches to gas 2
unsigned int delaycount=0,s=0;
char userlaoblename[14]="+91850013809";
void clear_buffer(void);
void reading(void);
unsigned char tempsize=0xFF;

void setup()
{
  // Open serial communications and wait for port to open:
  Serial.begin(9600);
  while (!Serial) {
    // wait for serial port to connect. Needed for Leonardo only
  }
  delay(20);
}
    
```

FIG: SOURCE CODE WRITTEN IN ARDUINO COMPILER

## 5. Results:

Bus location indication system is designed to enable the passengers know the arrival and departure timings of the buses to the bus stops correctly so that they can schedule their journeys perfectly. This system is designed using Arduino UNO. Each bus is equipped with a RFID card with a unique ID number written in it. The entry and exit of the bus stop points will be fixed with RFID reader. When the bus arrives at the bus stop, the RFID reader reads the card number and an entry will be made with the bus number and time of arrival in the database. Similarly when the bus departs from the bus stop, the reader at the exit point reads the RFID card of the bus and the exit time and bus number will be stored in the database. LCD displays the bus number, arrival and departure times. The bus arrival, departure times and number data will be written into the SD card. This is to maintain the bus records on a long run and the data will not be erased at any time.



<b>Bus 103</b>				
Id_pass	Arrival time	Bus Service in order	Ticket Service Time	Time Depart
1	08:50:21 AM	1	9:24:52 AM	9:29:12 AM
5	08:55:43 AM	1	9:25:12 AM	9:29:12 AM
7	08:59:35 AM	1	9:25:32 AM	9:29:12 AM
8	08:59:46 AM	1	9:25:52 AM	9:29:12 AM
10	09:07:15 AM	1	9:26:12 AM	9:29:12 AM
11	09:07:57 AM	1	9:26:32 AM	9:29:12 AM
12	09:08:56 AM	1	9:26:52 AM	9:29:12 AM
19	09:16:49 AM	1	9:27:12 AM	9:29:12 AM
22	09:18:35 AM	1	9:27:32 AM	9:29:12 AM
25	09:23:19 AM	1	9:27:52 AM	9:29:12 AM
27	09:25:00 AM	1	9:28:12 AM	9:29:12 AM
28	09:25:32 AM	1	9:28:32 AM	9:29:12 AM
29	09:27:11 AM	1	9:28:52 AM	9:29:12 AM
31	09:28:48 AM	1	9:29:12 AM	9:29:12 AM

## 6. Conclusion:

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### Advantages:

- No need of a person to enter timings
- Safe and secured
- Echo friendly; no need of paper.

### Applications:

- Useful for colleges, schools and offices busses
- Can be used for vehicle access control system in security zones
- Can be used for cabs monitoring system

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