

BUS TRACKING SYSTEM USING RFID

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Abstract- There has been a considerable amount of decrease in stock shortage with the use of Radio Frequency Identification (RFID) technology. Most of the RFID networks include a wide range of automation technologies. RFID provides effective communication facilities for the users. The technologies are RFID readers, RFID writers, RFID barcode scanners, RFID smart sensors and RFID controllers. Our idea is to track the bus timing using RFID. The RFID transmitter card is attached to the buses and it has a pin number, the RFID receiver is fixed in the bus stops and has a display of bus number and bus timing of the buses which crosses the bus stops. The software has been handled for the management, controlling, transaction reporting and operation tasks for bus stop located on various parts of the city.

Index Terms- RFID Tag

I. INTRODUCTION

Our project is to save time for the people who use their mode of transportation as town bus to reach their destination. The passengers have to wait for long time without knowing the presence of buses in the particular area. Our proposed system would be useful in areas where there is only limited number of buses available. Bus tracking system using RFID would help the people to view the bus number and timing (IN and OUT) in the display and they can choose their alternatives in case of either delay of bus or passenger. The manual works in the depot can be computerized and stored in the database for future use.

Radio-frequency identification (RFID) is the wireless use of electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects.

A. Objective

Our idea is to track the bus timing using RFID. The RFID transmitter card is attached to the buses and it has a pin number, the RFID receiver is fixed in the bus stops and has a display of bus number and bus timing of the buses which crosses the bus stops.

B. Motivation

Most of the people prefer town buses as their mode of transportation to reach their destinations. They also face problems like delay of buses and passengers to the bus stop. The passengers have to wait for long time without knowing the presence of buses in the particular area.

C. Scope

Our project would avoid the problems faced by the people and would be a solution to know accurately the timing and the presence of bus in the area. The RFID technology is used for tracking the bus timing and number with the help of RFID transmitter and RFID receiver. The stop also has the display board with the specification of IN and OUT timing of particular bus.

D. Problem Definition

The manual work done at the depot by the inspector will be reduced by this automation method. The data entered by the conductors may not provide correct information and at some case the bus may not follow the correct route due to traffic reasons which will affect the passengers.

E. Overview of Project

The project displays the bus number and timing in the bus stops. The project has the admin module where the admin has his own login and password to enter the entire details of the bus and the required information also to maintain the database. The tracking system with the RFID receiver and transmitter will provide the required details of buses in the stops with the LED display. The report can be maintained on the regular basis.

F. Project Impact

This system would be automated system and would reduce the manual work. In future the passengers will not suffer the problems faced now. It also provides the easy retrieval of data from the database and also reduces the stock storage.

G. Project Outcome

Bus timing and number of the corresponding buses will be displayed in the bus stops with the notification like IN and OUT using

radio frequency identification .It is useful in places where there is only limited number of buses.

II. SYSTEM SPECIFICATION

A. Hardware requirements

- ✓RFID Tag
- ✓RFID Receiver
- ✓Microcontroller 8051
- ✓RS 232 cable
- ✓Monitor display

B. Software requirement

- ✓Front end Visual Studio 2010
- ✓Database SQL server management 2008
- ✓Coding language .Net, C#.

Radio frequency identification

Radio-frequency identification is the wireless of electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. The tags contain electronically stored information. Some tags are powered by electromagnetic induction from magnetic fields produced near the reader. Some types collect energy from the interrogating radio waves and act as a passive transponder. Other types have a local power source such as a battery and may operate at hundreds of meters from the reader. Radio frequency identification (RFID) is one method for Automatic Identification and Data Capture (AIDC).RFID tags are used in many industries. An RFID tag attached to an automobile during production can be used to track its progress through the assembly line.

The RFID technology has two components-the reader and the tag, the reader has two parts- a transceiver and an antenna. The transceiver generates a weak radio signal that may have a range from few feet to a few yards. The signal is necessary to wake or activate the tag and is transmitted through the antenna. The signal itself is a form of energy that can be used to power the tag.

In our project we use PASSIVE RFID tag. It is likely to be most wide spread RFID tags in the market because of their low prices that makes them suitable for wide range of applications. Moreover, passive tags can withstand the challenging environmental conditions. Passive RFID tags can be used in low frequency, high frequency and ultra high frequency. Most passive UHF RFID tags

feature linearly polarized antennas that provide high directionality and therefore high orientation sensitivity with reduced read range. Passive RFID tag communicate with a reader only when the enter its action field. An RFID reader, also known as an interrogator, is a device that provides the connection between the tag data and the enterprise system software that needs information. The reader communicates with the tags that are within its field of operation. The reader uses an attached antenna to capture data from tags. It then passes the data to computer for processing. Just like RFID tags, there are many different sizes and types of RFID readers. The readers can also be fixed in a stationary position the reader and reader antennas work together to read tags.

III.SYSTEM DESIGN

A. System Architecture

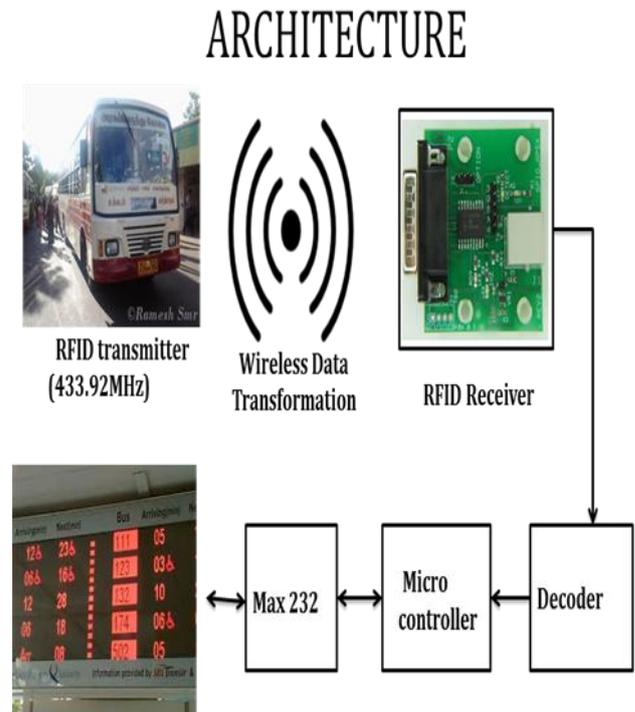


Figure 3.1 architecture

B. Input design

Input design is the process of converting admin-originated inputs to a computer-based format. Input design is one of the most expensive phases of the operation of computerized system and is often the major problem of a system. The input design requirements are user friendliness and consistent format in the project, the input design is

made as an software with buttons for “admin” to maintain and view the details.

In this system the input designs are

- first page
- Admin login page
- Registration page



Figure b.1 Login page.

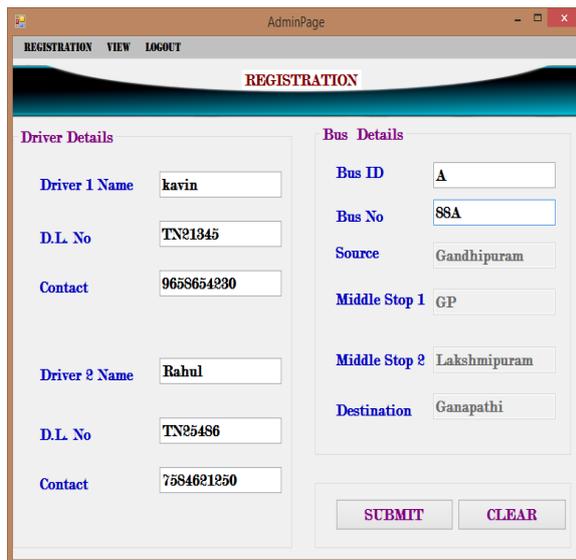


Figure b.2 Registration form

C. OUTPUT DESIGN

Output design generally refers to the results and information that are generated by the system for the passengers and admin. Output is the main reason for developing the system and the basis on which they evaluate the usefulness of the application. The output design specifies the results. The output design is one that provides a customized page to the end user. The output design acts as a medium of communication to the user by providing

the desired page that may be either used for storing data or fetching from the database. A quality output is one, which meets the requirements of the end-user and presents the information clearly. In any system the results of processing are communicated to the passenger and to other systems through outputs.

In our system the final output is to display the time of the buses in stop and the report is generated from the database.



Figure c.1 Bus stop display

IV. SYSTEM IMPLEMENTATION

Modules:

This project consists of four major modules

- Admin section
- Bus section
- Tracking System
- Report Maintenance

A. MODULE DESCRIPTION

Admin section:

In this module, the administrator has the control over the entire system. The system is processed by admin who first login to proceed to the registration. In the registration page the admin enter the details of the buses such as bus id, bus number, source and destination the particular buses. The admin also maintains the report of the buses in daily basis with the driver details.

Bus section:

In Bus section module, Each and every Bus has a separate RFID transmitter card which is placed in the bus, RFID receiver which is placed in the bus stop with a display. When a Bus reach a particular Bus Stop the Bus Number, Bus Timing(IN and OUT specification) will be

displayed. Our RFID receiver receives the Signal from Bus RFID Tag and update in database.

Tracking System:

In this module, the RFID receiver receives the signal from the RFID transmitter card and display the timing and number of the buses in the bus stop. The tracked details will be updated in the database and reports can also be generated.

Report Maintenance:

In this module, the reports are generated and maintained on the daily basis from the updated details stored in the database.

V. SCREEN SHOTS

Login page:



Figure 1 Selection page



Figure 2 Loginpage

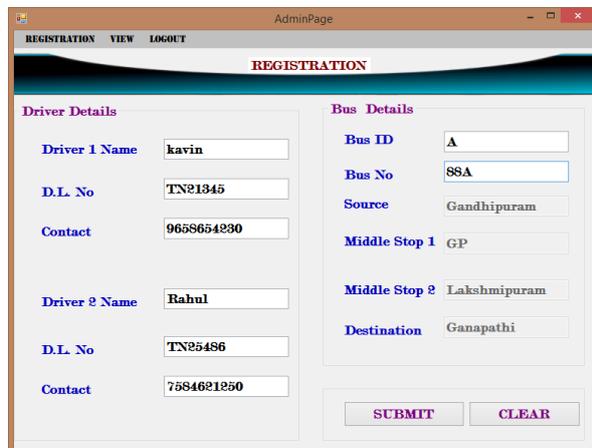


Figure 3 Registration

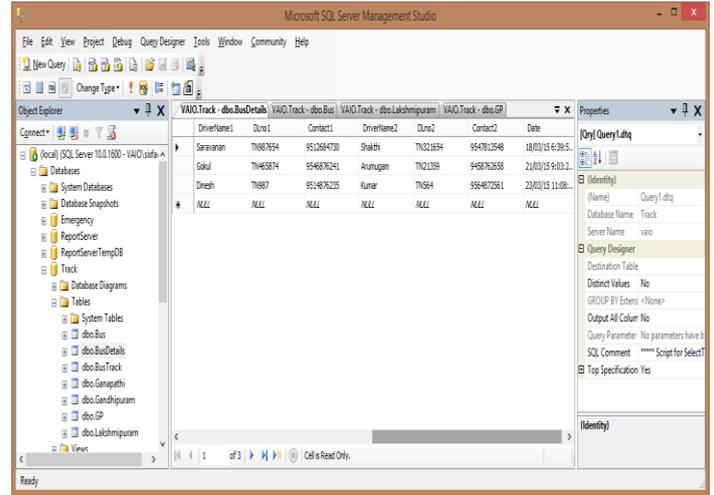


Figure 4 bus detail storing

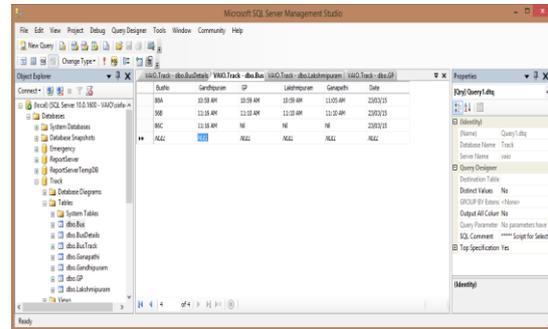


Figure 5 Driver detail storing

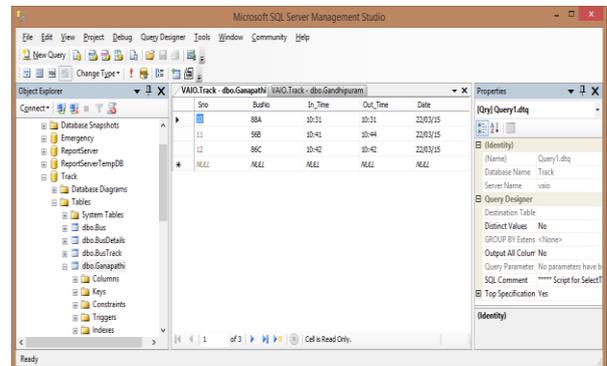


Figure 6 Bus timing

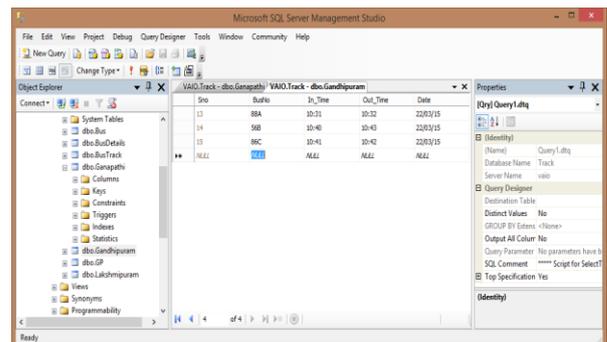


Figure 7 Bus stop2 details

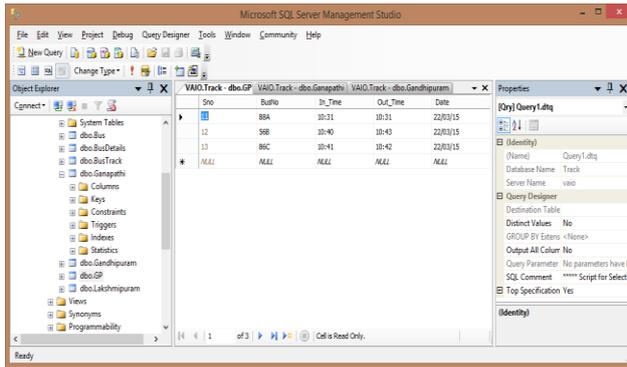


Figure 8 Bus stop3 details

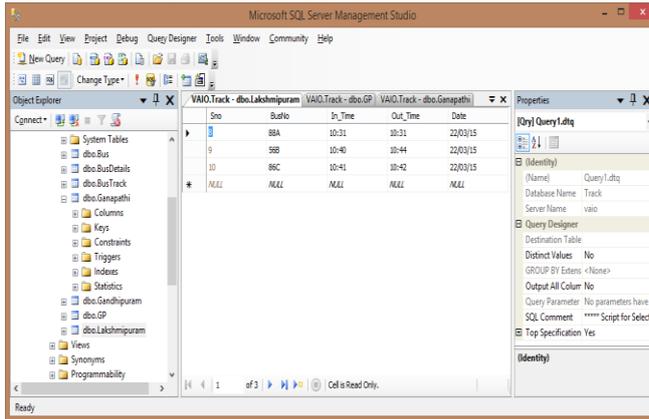


Figure 9 Bus stop4 details

VI. CONCLUSION

Our project would be a helping factor where the passengers could get the details about the presence of bus in the particular area or not with our application. The bus number and bus timing of the buses will be displayed by using the automated technique RFID. It is also help to maintain the bus details periodically. The required information can also be retrieved from the database easily and it also reduces the manual work. This system would provide a effective communication facility with the user.

VII. FUTURE ENHANCEMENTS

Our project will be enhanced in the future with the use of GPS which will provide the current position of the bus before the arrival to the bus to particular stop. It can also be used in the ambulance were we could know the position of the ambulance so it will be useful to clear the traffic in the upcoming positions. RFID can also be implemented in TOLL GATES to know the vehicle arrival time from the database and the cash payment can be done as a monthly basis.

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