JES
Journal of Engineering Sciences

Vol 13, Issue 04, APRIL /2022
ISSN NO:0377-9254

# RFID BASED BUS IDENTIFICATION SYSTEM FOR BLIND WITH VOICE ALERTS

**Viligilla Ramya [1], Vutkuri Srinivas[2]**

1. Post Graduate scholor, Malla Reddy Engineering College, Kompally, Ranga Reddy, Telangana.
2. Assistant Professor, Department of Electronics and Communication Engineering, Malla Reddy Engineering College, Hyderabad-500100, India

*Abstract:* ***Blind people couldn't identify the exact bus related to his/ her destination area. This paper demonstrates a bus detection system to help blind people to travel smoothly and independently from one place to another by providing complete and clear information. This project consists of a RFID module, LCD, Voice Module, and a microcontroller board. The RFID tags are attached to the busses and the entire system is at the bus stop. Whenever the bus reaches the bus stop the system announces the bus information using voice module and also displays on the LCD. In the bus station subsystem, the coming buses will be detected and then announced in the bus station in order to alert the blind people. A complete system prototype has been constructed and tested to validate the proposed system.***

***Keywords— RFI, voice module, system integration, blind, detection.***

## I. INTRODUCTION

Blind people desperately need special requirements and services including the public transportation to give them the rights and ability to move smoothly and independently from one place to another. Blindness limits the type of transportation a person can use and hence, the blind may suffer additional delay compared to a normal person because of the limited transportation choices. The most used transport means for blind people is the public transportation, which is considered as one of the important means for travelling in many countries but it is not possible for the blind to identify the bus travelling to his/her desired destination.

The purpose of this paper will be to develop a design and propose a plan to implement RFID technology that will help the blind people navigate. **Radio Frequency Identification** (RFID) refers to a wireless system comprised of two components: tags and readers. The reader is a device that emits radio waves and receives signals back from the RFID tag that has one or more antennas. Buses consist of a RFID tag upon reaching the bus station this tag will be read by the RFID reader and announces the bus information using LCD display and voice module in the bus station to alert the blind people. As the blind people already give their destination information, this information is stored into temporary database, if the bus destination matches the destination database the bus driver is intimated about the number of blind people so, the driver makes sure that they get into the bus.

## II. Related Work

Several systems had been proposed for guiding blind people. Here we will just mention the most related ones to the theme of our project. One of these systems is a central announcement system based on Bluetooth technology. In this system, Bluetooth devices are installed in both the bus and the bus station which are connected to a processing subsystem. When a bus approaches the station, the two Bluetooth devices of the bus and the station will connect to each other. After that, the bus Bluetooth device will transmit a message containing bus information to the station's processing subsystem. The transmitted message will be read by a text to speech converter which is interfaced with the processing subsystem in the bus station. Then, an announcement message contains the bus information will be generated through a speaker. But there are two disadvantages in this system: it allows connection of two devices only at once and it can lose connection in certain conditions. To overcome this, we used RFID in place of Bluetooth.

## III. PROPOSED APPROACH

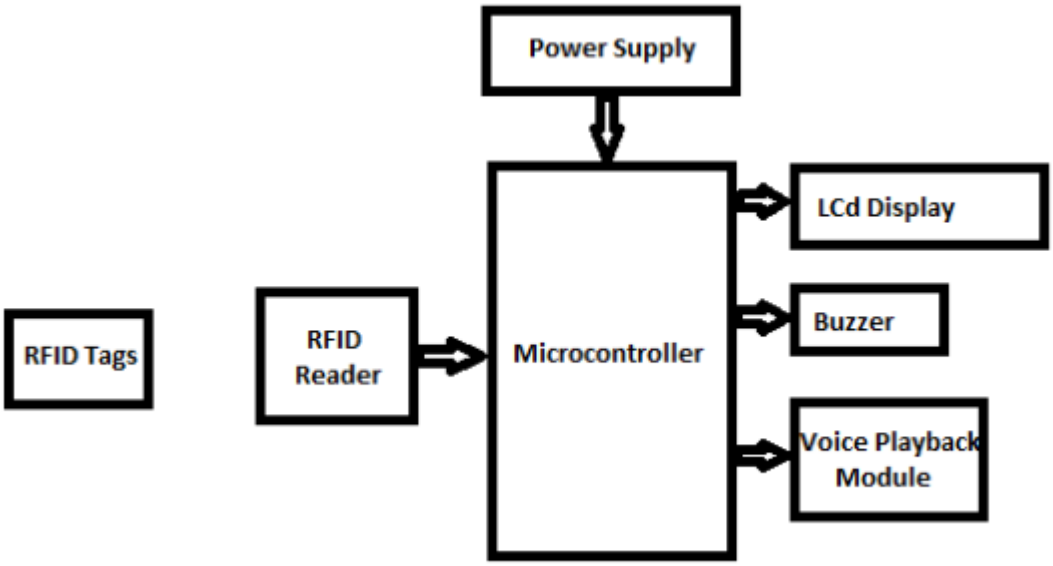



Fig: 1 Block diagram of proposed system

**Microcontroller**: It provides all of the circuitry necessary for a useful control task: a microprocessor, I/O circuits, a clock generator, RAM, stored program memory and any necessary support ICs.

**RFID Tags**: RFID tags contain an integrated circuit for modulating and demodulating radio frequency and an antenna for transmitting and receiving signals. Frequency ranges vary from low frequencies of 125 to 134 kHz and 140 to 148.5 kHz, and high frequencies of 850 to 950 MHz and 2.4 to 2.5 GHz

**RFID Reader**: Tags transmit data to the RFID reader. The reader then converts the radio waves to a more usable form of data. Information collected from the tags is then transferred through a communications interface to a host computer system, where the data can be stored in a database and analyzed at a later time.

**Power Supply**: A power supply is an electrical device that supplies electric power to an electrical load. The primary function of a power supply is to convert electric current from a source to the correct voltage, current, and frequency to power the load.

**LCD Display**: An LCD is an electronic display module that uses liquid crystal to produce a visible image. The 16×2 LCD display is a very basic module commonly used in DIYs and circuits. The 16×2 translates o a display 16 characters per line in 2 such lines. In this LCD each character is displayed in a 5×7 pixel matrix.

**Buzzer**: A buzzer is an audio signaling device which may be mechanical, electromechanical or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as mouse click or keyboard.

**Voice playback module**: Voice recording module offers true single chip solid state storage capability and requires no software or micro-controller support. It provides high quality

Recording and playback. One button is pushed down to record the message through the on-board electrets microphone; A LED turns on during this time. The other button just has to be momentarily pressed to replay the message.

**SOFTWARE REQUIRED-ARDUINO IDE**

The **Arduino Integrated Development Environment (IDE)** is a cross platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards.

The source code for the IDE is released under the GNU General Public License, version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main () into an executable cyclic executive program with the GNU tool chain, also included with the IDE distribution. The Arduino IDE employs the program to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware. By default, avrdude is used as the uploading tool to flash the user code onto official Arduino boards.

Arduino IDE is a derivative of the Processing IDE; however as of version 2.0, the Processing IDE will be replaced with the Visual Studio Code-based Eclipse IDE framework. With the rising popularity of Arduino as a software platform, other vendors started to implement custom open-source compilers and tools (cores) that can build and upload sketches to other microcontrollers that are not supported by Arduino's official line of microcontrollers.

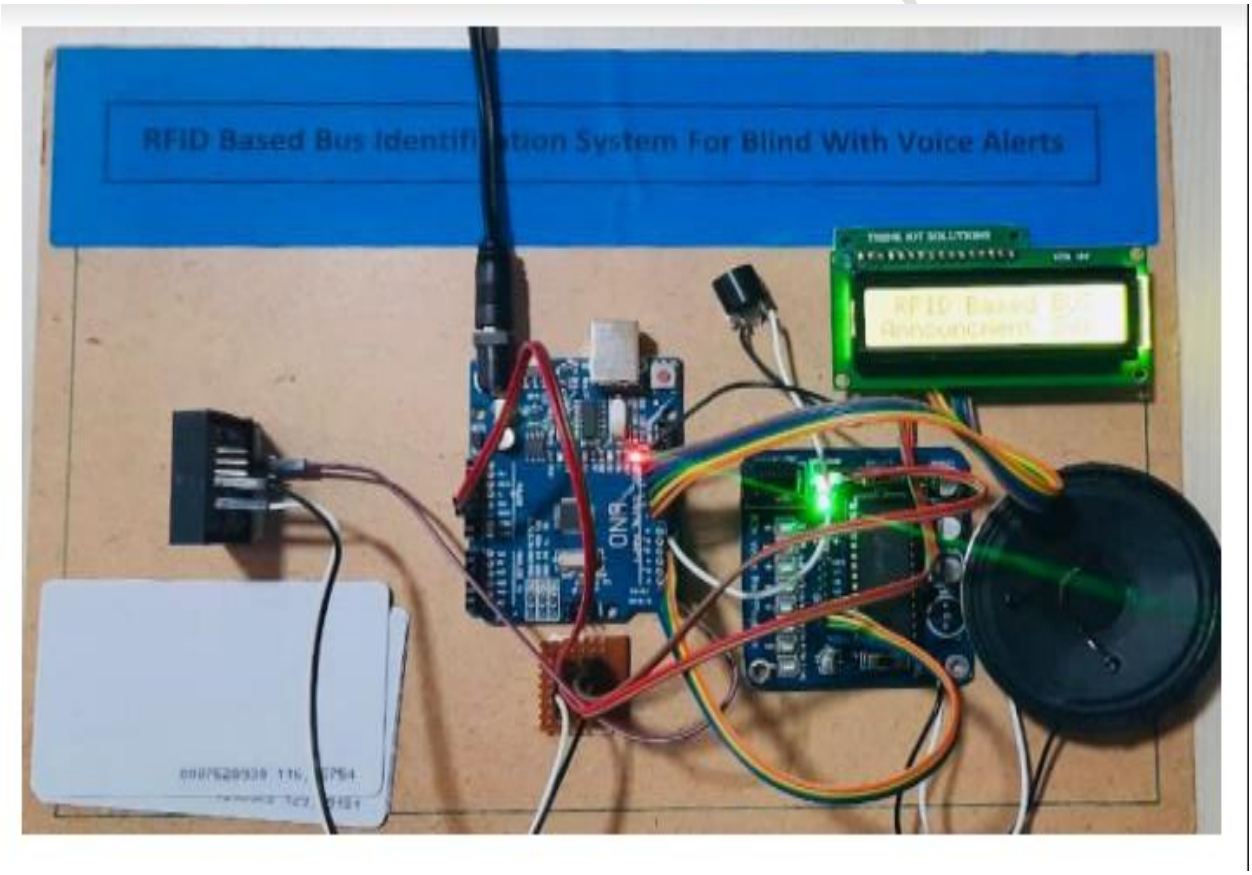
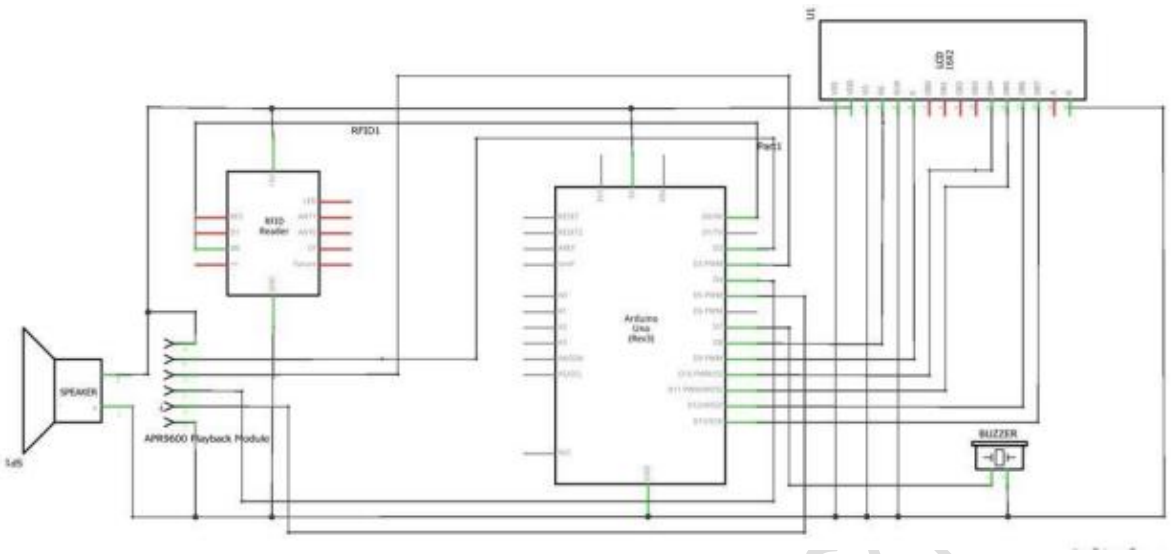



Fig. 2: Hardware implementation kit




## IV RESULT

1. When first RFID tag is read by the reader, the respected output is displayed on LCD screen as shown in the below figure and also read it out by the speaker

**First output**

2. When second RFID tag is read by the reader, the respected output is displayed on LCD screen as shown in the below figure and also read it out by the speaker


**Second output**

3. When third RFID tag is read by the reader, the respected output is displayed on LCD screen as shown in the below figure and also read it out by the speaker


**Third output**

## IV CONCLUSIONS

A feasible system to assist the blind people to have a safe and normal travel by public transport system has been proposed and the prototype has been tested for different sample RFID tags. The performance of the system is satisfactory and promises to eliminate the difficulties faced by the blind people for their day-to-day travel requirements in availing public transport systems. Using the ultra-high frequency radio waves, we have shown implementing a system which will use the RFID tag and reader setup along with customized program that will help the blind in identifying exact bus. Results of tests indicated that this system could help users to successfully board their desired buses, using the interactive communication modules. Thus, showing the possibility of using the RFID technology to help the blind.

## REFERENCES

[ 1 ]. J. Al Kalbani, R. B. Suwailam, A. Al Yafai, D. Al Abri and M. Awadalla, Bus Detection System for Blind People using RFID, Proceedings of the 8th IEEE GCC Conference and Exhibition, Muscat, Oman (2015).

[ 2 ]. IEEE Standard C95.1 (2005), IEEE Standard for Safety Levels with Respect to Human Exposure to RadioFrequency Electromagnetic Fields 3 kHz to 300 GHz, Available from: http://standards.ieee.org/findstds/standard/C95.1-2005.html, Accessed 25 (2015).

[ 3 ]. On the Bus Public Transport, Available at: http://www.onthebus-project.com, Accessed 25 November (2015).

[ 4 ]. New York Transportation Statistics, Available from: http://transportation-modescity. Find the data.org/q/1447/1033/How-many-people-use-public-transportation- to commute- in New-York, Accessed 25 November (2015).
*international journal of u- and e- Service, Science Technology*., 3(3) (2010).

[ 6 ]. M. Z. H. Noor, A. Shah, I. Ismail and M. F. Saaid, Bus Detection Device for the Blind Using RFID Application, 5th International Colloquium on Signal Processing & Its Applications, 247-249 (2009).

[ 7 ]. T. Jerry, H. Goh and K. Tan, Accessible Bus System: A Bluetooth Application, Assistive Technology For Visually Impaired and Blind People, Chapter in Assistive Technology for Visually Impaired and Blind People, Springer, London (2008) 363-384.