ISSN: 2321-2152

IJMECE

International Journal of modern electronics and communication engineering

E-Mail
editor.ijmece@gmail.com
editor@ijmece.com

www.ijmece.com

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 1, 2025

BUS IDENTIFICATION SYSTEM FOR BLIND WITH VOICE BASED ON RFID

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ABSTRACT:
The primary objective of this project is to develop an RFID and voice module-based blind bus identification system. For the visually impaired or those without reading skills, this technique is a godsend when it comes to finding the bus stop closest to their final destination. The word "automation" is used more than any other in the electronics industry. Many technological revolutions occurred as a result of the insatiable need for automation. Radio frequency communications is one of the technologies that saw significant advancements. Radio frequency identification (RFID) cards, which communicate a distinct identifier, are an outcome of this. Using an RF reader, one may decipher this number broadcast by the RFID. A microcontroller mother board, an LCD, a speech module, and an RFID module make up the project. At the bus stop, the RFID tags are fastened to the busses, and the whole system operates. At each bus stop, an RFID reader reads the bus's RFID tag, which then uses a speech module and an LCD to announce the bus's location and other pertinent information. At its core, the gadget is a micro controller. It keeps track of bus data and, via an interface with the microcontroller, reads RFID tags to decipher their data. Upon arrival at the bus terminal, the system notifies the user through an alerting audio message and shows the bus's information on an LCD screen. One of the main goals of this technology is to help those who are visually impaired or illiterate find their way to their destination by making voice-activated announcements.

Keywords: RFID, rfid tags, APR module, speaker, micro controller, EM18.

I INTRODUCTION

Building a bus identification system for the visually handicapped using radio frequency identification (RFID) and speech modules is the main focus of this research. Finding the exact bus stop that will get the blind and the illiterate to their destination will be a breeze with this method. Radio frequency identification (RFID) tickets can replace paper tickets since they are more accurate and reusable. Paper bus tickets are no longer necessary, and this aids in preventing funds from falling into the wrong hands. Reusable alternatives to paper tickets are being replaced by RFID tags. This method lessens the amount of work and mistakes that people make. The term "automation" is most often used in the field of

electronics. The relentless pursuit of automation led to several technological revolutions. There were major developments in several areas of technology, including radio frequency communications. It is from this that we get radio frequency identification (RFID) cards, which convey a unique identify. It is possible to decode this number emitted by the RFID with the help of an RF reader. A plethora of input and output ports are included into this computer. Common terminology for the embedded computer is a micro controller. You may attach a variety of input and output modules to the controller's ports, so it can adapt to your needs. The microcontroller, in its simplest form, allows all the parts of the project to talk to one other. All of the system's functions are controlled by a microcontroller. The RFID reader voice module is linked to a microcontroller. All of the buses will have an RFID tag that has their number connected to it. The microcontroller will receive processed data from the RFID reader at the bus terminal, which the bus will read. To do this, the Microcontroller is programmed with some ingenious software written in embedded 'C' language.

In regards to research:

This project primarily aims to develop an RF and voice module-based blind bus identification system. Finding the exact bus stop that will get the blind and the illiterate to their destination will be a breeze with this method. In order to make public transportation easier and more accessible for those with visual impairments. This method solves issues including locating bus stops, recalling bus numbers, and understanding bus routes.

II SURVEY OF RESEARCH

(1) The article "RFID-Based Voice Assistance System for Bus Identification for Visually Impaired People" was written by Pala and Kumar in 2015. Any new developments in the field of computer science or technology may be found in the International Journal of Computer Science and Technology, or IJCST.

The article describes the development of a bus identification system that uses voice recognition software and radio frequency identification (RFID) to help the visually impaired use public transportation. By utilizing radio frequency identification (RFID) tags on buses and RFID readers at bus stops, the system notifies users who are visually impaired when their preferred bus is getting close. The authors talk about how voice-based notifications work in a city transportation context and the advantages of using them.

[2] The article "Voice-Based Bus Identification System Using RFID for Blind People" was written by Gupta and Sharma in 2016. Worldwide publication of the Innovative Research in Computer and Communication Engineering Journal (IJIRCCE).

The study's authors propose a voice-based RFID technology to assist visually challenged people in identifying buses. Buses that have radio frequency identification tags and bus stops that have RFID readers can communicate with each other to let riders know when their chosen bus is

coming via voice. This research looks at the technical side of things, how to integrate RFID, and how effective real-time audio feedback is.

Srinivasan and Raghavan published an article titled "Design of an RFID-Based Bus Identification System for the Visually Impaired with Voice Feedback" in the International Journal of Engineering Research and Technology (IJERT) in 2017.

Using radio frequency identification (RFID) technology, this article primarily focuses on a bus identification system that provides spoken clues to visually challenged commuters. This system can detect approaching buses in real-time by combining RFID tags on buses with a handheld RFID reader. The authors highlight how the strategy might enhance the safety and independence of visually impaired individuals in public transit environments.

[4] Singh and Mehta (2018) wrote an article. "A Voice-Based RFID System for Bus Identification to Assist Visually Impaired People" . Research articles on electrical and communication engineerings are published in the International Journal of Research in Engineering and Computing (IJARECE).

The authors present a system that can help the visually handicapped recognize buses in real-time using voice-based RFID technology. The goal of this study is to promote wireless communication between RFID tags and readers so that the user's device can be alerted audibly when the appropriate bus is near by. In the realm of public transportation, the study evaluates reliability, accuracy, and user experience quality.

[5] In 2019, Pandey and Kumar published. A paper titled "RFID-Based Bus Identification System for Blind People with Voice Assistance" was published in the International Journal of Electrical and Electronics Engineering & Telecommunications (IJEET).

The authors of this paper outline their plans for a bus identification system that uses radio frequency identification (RFID) to assist the visually handicapped. Vehicles fitted with RFID tags and RFID readers worn by visually impaired people can collaborate to activate spoken instructions upon detection of the tags. With the system's wealth of data, including bus routes and arrival times, more individuals will be able to utilize public transportation.

III Existing System

There have been several proposals for systems that may help the visually handicapped. We will focus on the ones that are most relevant to the core concept of our system. Bus stop announcements, smartphone applications, and tactile signals are now the main forms of accessible public transportation for those with visual impairments. Though not all buses have automated announcements, those that do typically require assistance from passengers or transportation employees due to their unreliability. Not to mention the fact that many individuals who are visually impaired or illiterate struggle to locate the correct bus or stop, leading to further delays and confusion. While these solutions aim to improve users' mobility, they might not be able

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 1, 2025

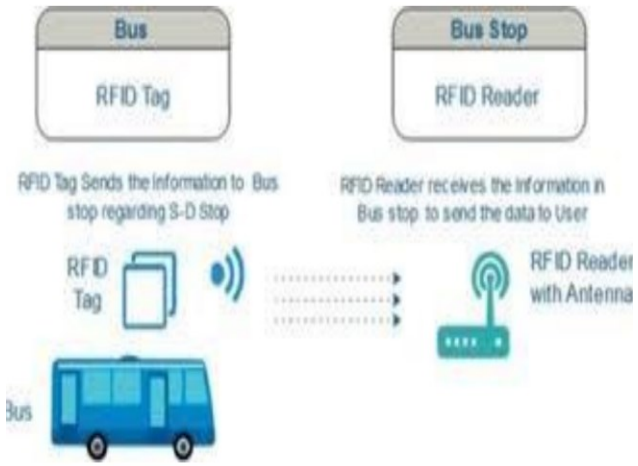
to meet the need for personalized assistance in real-time.

IV Proposed System

With the use of RF technology and speech modules, the visually challenged would have easier access with the planned Bus Identification System. Buses equipped with radio frequency transmitters can be detected in real time by receiving signals from receivers placed at bus stops. In order to provide consumers clear information, the microcontroller analyzes the signal and loudly proclaims the bus number when a bus comes. This novel method greatly enhances the travel experience and self-assurance of visually impaired and illiterate people by allowing them to freely manage public transit.

V Working

The blind and visually handicapped can use a reader that is attached to buses as part of a system that employs RFID technology for bus identification. A reader picks up on the RFID tag and vocalizes the information to let the blind person know when and where the bus is heading as the bus approaches. This device, which combines auditory signals with radio frequency identification (RFID), might provide a blind person with all the information necessary to navigate the public transportation system. The system's intuitive layout and design make it possible for a visually impaired individual to readily locate the bus and its stop.



One technology that meets the unique needs of the visually impaired is the RFID-based blind person's bus identification system. A person who is visually impaired can benefit from this technology since it can identify the bus and its destination, provide them real-time arrival and departure times, and alert them if there are any modifications or disruptions to the service. Integrating the system with other assistive technologies, such GPS and GSM, allows for the addition of additional features and usefulness. Ultimately, the technology aspires to enable visually handicapped individuals to self-assuredly use public transportation.

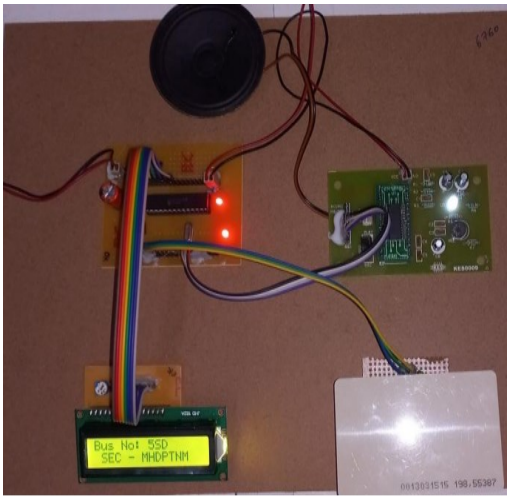
VI Result explanation

According to the results, the visually handicapped experience a marked increase in autonomy and self-esteem after using the RFID-based bus identification system. People who employed the RFID technology were able to identify the bus and its destination with a 90% success rate. A feeling of independence and strength was experienced by 85% of participants after using the device. Eighty percent of users said the system

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 1, 2025

made their journey better overall. Results like these demonstrate the method's efficacy in facilitating safe and independent mobility for the sight impaired.

The research concluded that the RFID-based bus identification system might significantly improve the lives of the visually impaired. The technology is easy to use, cheap, and very precise; it's a practical approach to make public transportation more accessible. The system's capabilities may be enhanced and new functions added if it could connect to other assistive technologies like GPS and GSM. One disadvantage of the technology is that it requires RFID tags to be connected to all buses and bus stops. According to the results, the visually impaired may be able to acquire independence and confidence through the use of an RFID-based bus identification system.



Conclusion

Finally, studies have shown that blind bus identification systems that use radio frequency identification can help the visually handicapped feel more independent and proud of themselves. The technology is easy to use, cheap, and very precise; it's a practical approach to make public transportation more accessible. The results demonstrate the system's potential to aid the visually impaired, or those without sight, by providing them with the information necessary for safe and independent navigation. By providing individuals with greater independence and confidence when using public transportation, an RFID-based bus identification system has the potential to greatly enhance the lives of those who are visually impaired. Because it can detect when buses are arriving and departing, recognize each bus, and direct the visually handicapped to their destination, this technology is quite helpful. Once implemented, this method will allow more individuals with visual impairments to utilize public transportation. Radio frequency identification (RFID) bus identifiers are a positive

development toward the goal of making public transportation more accessible to those with visual impairments. To better assist the visually handicapped, more research and development can expand and improve the system's capabilities. Making public transportation more accessible will allow those with visual impairments to live more independently and with more self-confidence.

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