IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 10, May 2023

Real Time Bus Tracking System

Prof. Namithadevi N N[1], Hirabai[2], Lavanya[3], Ruchitha BT[4], Sukrutha R[5]
Professor, Department of Computer Science and Engineering[1]
Students, Department of Computer Science and Engineering[2,3,4,5]
VidyaVikas Institute of Engineering and Technology, Mysore

Abstract: *The advancement of Internet of Things (IoT) technology has enabled the development of various real-time tracking systems. In this paper, we propose a system for live bus tracking utilizing IoT components, including an RFID tracker, NodeMCU, GPS module, GoDaddy web hosting service, Android mobile platform, Java programming language, and MySQL database. The system aims to provide accurate and real-time information about bus locations, allowing users to track buses remotely and plan their journeys efficiently. The RFID tracker is integrated into each bus, enabling identification and authentication of the bus. It provides a scalable and reliable solution for data storage and retrieval. The proposed system demonstrates the potential of IoT technology in enhancing public transportation systems. It offers benefits such as improved.*

Keywords: Internet of Things, live bus tracking, RFID tracker, NodeMCU, GPS module, GoDaddy, Android application, Java, MySQL database

I. INTRODUCTION

In recent years, the Internet of Things (IoT) has revolutionized the way we interact with our surroundings. By seamlessly connecting physical devices and enabling data exchange, IoT has found applications in various domains, including transportation. The proposed system for live bus tracking utilizes several IoT components, including an RFID tracker, NodeMCU, GPS module, GoDaddy web hosting service, Android mobile platform, Java programming language, and MySQL database. These components work together to create a comprehensive and efficient tracking system.The RFID tracker is integrated into each bus and serves as a unique identifier for the bus. It enables authentication and identification, ensuring that the system accurately tracks the correct bus.

1.1 Objective

The objective of implementing a live bus tracking system using IoT components, including an RFID tracker, NodeMCU, GPS module, GoDaddy, Android, Java, and MySQL, is to enhance the efficiency and convenience of public transportation for passengers. The system aims to achieve the following specific objectives:
Real-time Bus Tracking: The primary objective is to provide real-time tracking of buses, allowing passengers to have up-to-date information about the bus locations. This helps passengers plan their journeys more effectively, reducing waiting times and minimizing uncertainty.

II. LITERATURE SURVEY

"Real-Time Bus Tracking System Based on IoT and GPS" by R. Velu and S. Venkatesan (2019):
This research paper proposes a real-time bus tracking system using IoT and GPS technologies. The study focuses on the integration of GPS modules in buses to track their locations and transmit the data to a central server. The system also includes a web-based interface for users to access bus location information.
"Smart Bus Tracking and Management System using IoT" by P. Sridhar and G. Manikandan (2018):
This paper presents a smart bus tracking and management system that utilizes IoT components such as GPS, RFID, and GSM. The system enables real-time tracking of buses and provides features like automated fare collection, passenger information, and route optimization. The study highlights the benefits of the proposed system in terms of efficiency and passenger satisfaction.
"Design and Development of Bus Tracking System using IoT and RFID" by N. K. Rai and P. K. Patnaik (2017):

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 10, May 2023

The research focuses on designing and developing a bus tracking system using IoT and RFID technologies. The system employs RFID tags to track buses and GPS modules for accurate location tracking. The study discusses the integration of these components and presents a prototype implementation.

"IoT-based Bus Tracking System using GPS and GSM Technology" by A. R. Patil and P. M. Shendkar(2016):

This paper proposes an IoT-based bus tracking system that utilizes GPS and GSM technologies. The system tracks buses in real-time using GPS modules and transmits the data to a central server via GSM networks. The study emphasizes the importance of efficient data communication and presents a prototype implementation.

"Real-Time Bus Tracking and Management System for Public Transport using IoT" by R. Kaur and A. Arora (2019):

The research presents a real-time bus tracking and management system based on IoT. The system integrates GPS modules in buses to track their locations and transmits the data to a central server. "Live Bus Tracking and Passenger Information System using IoT" by K. S. Manjula and K. R. Krishna (2018):

This paper proposes a live bus tracking and passenger information system using IoT. The system utilizes GPS modules in buses for real-time tracking and transmits the data to a central server. The study also includes a web-based interface and a mobile application for users to access bus location information and receive notifications.

"An IoT-based Real-Time Bus Tracking and Monitoring System" by V. B. Dhokre et al. (2018):

The research presents an IoT-based real-time bus tracking and monitoring system. The system employs GPS and GSM technologies for location tracking and data communication. The study discusses the architecture, implementation, and benefits of the proposed system in terms of improved bus management and passenger satisfaction.

2.1 Existing System

There are several existing systems for live bus tracking that have been implemented by transit agencies and organizations worldwide. These systems utilize advanced technologies such as GPS, real-time data communication, and user-friendly interfaces updates of buses using GPS technology. TransLoc provides a mobile application and website that allow users to access bus location information, estimated arrival times, and route maps.NextBus is another widely used live bus tracking system that leverages

2.2 Proposed System

The proposed system for live bus tracking leverages IoT components to create an efficient and reliable solution. The system comprises an RFID tracker, NodeMCU, GPS module, GoDaddy web hosting service, Android platform, Java programming language, and MySQL database.Each bus is equipped with an RFID tracker, which serves as a unique identifier. This tracker enables accurate identification and authentication of buses, ensuring that the system tracks the correct bus.

III. PROPOSED METHODOLOGY

Proposed Methodology for Live Bus Tracking using IoT Components:

The key components of the methodology include the RFID tracker, NodeMCU, GPS module, GoDaddy web hosting service, Android platform, Java programming language, and MySQL database. The methodology can be summarized as follows:

4.1 Hardware Components:

RFID Tracker:

An RFID (Radio Frequency Identification) tracker is a device used for identifying and tracking objects or entities using radio frequency signals. It consists of two main components: an RFID tag and an RFID reader.

RFID Tag: The RFID tag is a small electronic device that contains a unique identifier and an antenna. It can be attached or embedded into objects or entities, such as buses in the context of live bus tracking.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 10, May 2023

Node MCU:
NodeMCU is an open-source development board based on the ESP8266 microcontroller. It combines the functionality of a microcontroller unit (MCU) with Wi-Fi connectivity, making it a popular choice for IoT (Internet of Things) projects.

GPS:
GPS (Global Positioning System) is a satellite-based navigation system that provides accurate location and timing information anywhere on Earth. It consists of a network of satellites, ground control stations, and GPS receivers.
Key components of the GPS system include:

How GPS works:
Trilateration: The GPS receiver measures the time it takes for the signals to travel from the satellites to the receiver. By comparing the arrival times of the signals, the receiver can calculate the distance from each satellite.
GPS has become an integral part of various applications, including navigation systems, tracking devices, surveying and mapping, precision agriculture, logistics, and outdoor recreational activities.

Godaddy:
GoDaddy is a well-known and widely used web hosting and domain registration company. It provides a range of services related to website hosting, domain registration, website building, email services, and online marketing tools.

Android:
Android is an open-source operating system primarily designed for mobile devices such as smartphones and tablets. It is developed by Google and based on the Linux kernel. Android provides a flexible and customizable platform for developers offers a wide range of features and functionalities for users.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 10, May 2023

JAVA:

Java is a widely-used, object-oriented programming language developed by Sun Microsystems (now owned by Oracle Corporation) in the mid-1990s. It is known for its simplicity, platform independence, and versatility, making it one of the most popular programming languages in the world.

MySql:

MySQL is an open-source relational database management system (RDBMS) widely used for managing and storing structured data. It is known for its reliability, scalability, and ease of use, making it a popular choice for both small and large-scale applications.

IV. RESULTS AND DISCUSSION

The results obtained from the implementation of the Live Bus Tracking system using IoT components, including Rfid Tracker, Node MCU, GPS, GoDaddy, Android, Java, and MySQL, were promising. The system successfully provided real-time bus tracking, efficient data storage, and a user-friendly interface for passengers. The integration of the Rfid Tracker, Node MCU, and GPS technologies enabled accurate and reliable bus tracking. The Rfid Tracker facilitated the identification and tracking of buses, while the Node MCU acted as a microcontroller, facilitating seamless communication between the different components. Tracking system offered several advantages for both bus operators and passengers. The real-time bus tracking and accurate location updates provided by the system allowed passengers to plan their journeys more efficiently and reduced wait times at bus stops. The system's user-friendly interface and personalized notifications received positive feedback from users, indicating a satisfactory user experience.The successful implementation of the Live Bus Tracking system using IoT components demonstrated its potential to enhance the efficiency and convenience of bus transportation. The system provided accurate bus tracking, real-time updates, and personalized notifications, improving the overall bus transportation experience. The results and feedback obtained from the implementation highlighted the system's usability, effectiveness, and the potential for further enhancements and optimization.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 10, May 2023

V. CONCLUSION

In conclusion, the Live Bus Tracking system offers several advantages for both bus operators and passengers. The utilization of RFID Tracker enables the identification and tracking of buses, ensuring accurate and reliable location updates. The Node MCU, acting as a microcontroller, facilitates the communication between the RFID Tracker, GPS module, and the central server. It allows for efficient data transfer and real-time monitoring of bus positions.The GPS technology plays a crucial role in providing precise location information for the buses. The application also allows for personalized notifications and alerts, enhancing the overall user experience. it has been observed that the proposed solution provides accurate and reliable bus tracking information. The system offers real-time updates, enabling passengers to plan their journeys more efficiently and reducing wait times at bus stops. The user feedback and satisfaction levels have been positive, highlighting the system's usability and effectiveness.In conclusion, the Live Bus Tracking

VI. FUTURE WORK

In the context of Live Bus Tracking using IoT components like Rfid Tracker, Node MCU, GPS, GoDaddy, Android, Java, and MySQL, there are several avenues for future work and enhancements. These areas can further improve the system's functionality, scalability, and overall performance.

One aspect of future work could focus on enhancing the accuracy and precision of bus tracking. This could involve exploring advanced algorithms or technologies to improve the location tracking capabilities of the GPS and Rfid Tracker. By increasing the accuracy of bus position updates, the system can provide even more reliable real-time information to passengers and bus operators.

Another area for future work is the integration of additional features and functionalities into the mobile application. This could include features such as live bus occupancy status, estimated arrival time adjustments based on traffic conditions, or integration with other transportation modes for seamless multi-modal journey planning. Expanding the capabilities of the mobile application can significantly enhance the user experience and provide more comprehensive information to passengers.

REFERENCES

[1]. Chen, C., Huang, C., & Lee, T. (2018). A Real-Time Bus Tracking System Based on IoT Technology. In 2018 International Conference on Advanced Robotics and Intelligent Systems (ARIS) (pp. 1-4). IEEE.
[2]. Ge, J., Tang, K., & Huang, Z. (2019). Bus Positioning System Based on Internet of Things Technology. In 2019 IEEE 6th International Conference on Cloud Computing and Intelligence Systems (CCIS) (pp. 468-472). IEEE.
[3]. Han, J., Lee, H., & Jang, W. (2016). Design and Implementation of Real-Time Bus Position Monitoring System Based on IoT. In 2016 12th International Conference on Intelligent Information Hiding and Multimedia Signal Processing (IIH-MSP) (pp. 557-560). IEEE.
[4]. Hassan, M., Ahmad, I., & Abbas, N. (2017). A Smart Real-Time Bus Tracking System Using IoT. In 2017 International Conference on Intelligent Systems Engineering (ICISE) (pp. 1-5). IEEE.
[5]. Kaul, R., Kumar, A., & Aggarwal, N. (2018). Real-Time Bus Tracking and Management System Using GPS and IoT. In 2018 3rd International Conference on Internet of Things: Smart Innovation and Usages (IoT-SIU) (pp. 1-4). IEEE.