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College Connect – A Real time College Bus Tracking Website

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ABSTRACT: The real-time college bus tracking website is designed to provide accurate and timely location updates of a college bus using IoT technology. The system integrates an Arduino, GPS module, and NodeMCU to capture the bus's longitude and latitude coordinates and upload them to the ThingSpeak web application. A 12V battery powers the system, while an LCD displays real-time location updates. The Android app fetches this data from ThingSpeak and displays the bus's current location along with its estimated arrival time. This system enhances convenience and safety for students by providing real-time tracking and reducing wait times.

Additionally, the website includes functionalities for users to set personalized notifications based on their schedules, facilitating better planning and reducing uncertainty associated with campus commuting. Historical data analysis provides insights into bus performance trends, enabling administrators to optimize routes, adjust schedules, and allocate resources more effectively.

In summary, the real-time college bus tracking website represents a significant advancement in campus transportation management, improving accessibility, user satisfaction, and operational efficiency. This innovative solution not only benefits individual users but also supports broader institutional goals of enhancing mobility and sustainability within the college environment. Through this implementation, the college community can benefit from improved accessibility and a more organized transportation system.

KEYWORDS: Real-time tracking, GPS module, Arduino, NodeMCU, ThingSpeak, IoT-based tracking system, Smart transportation

I. INTRODUCTION

In response to the growing demand for efficient campus transportation systems, College Connect is a comprehensive real-time bus tracking application specifically aimed for college environments. As educational institutions expand, managing transportation logistics becomes increasingly challenging, leading to issues such as prolonged wait times, overcrowded buses, and inefficient route management. This application aims to address these challenges by leveraging modern technology to enhance the user experience.

This project introduces a real-time college bus tracking system using IoT technology to improve safety and convenience for students. It uses an Arduino with a GPS module to capture the bus's location and a NodeMCU to upload the data to ThingSpeak. A 12V battery powers the system, and an LCD displays real-time location updates. Students can view the bus's current location and estimated arrival time through an Android app, reducing wait times and enabling better bus monitoring.

The system utilizes Global Positioning System (GPS) technology integrated with a user-friendly mobile application framework. Users can access real-time information about bus locations, track arrival times, and receive alerts regarding delays or route changes directly on their smartphones. The application features an interactive map interface, allowing users to visualize bus positions and estimated arrival times at their selected stops.

II. LITERATURE SURVEY

Real Time College Bus Tracking Application for Android Smartphone This paper proposes a Real-Time College Bus Tracking Application which runs on Android smart phones. This enables students to find out the location of the bus so that they won't get late or won't arrive at the stop too early. The main purpose of this application is to provide exact location of the student's respective buses in Google Maps besides providing information like bus details, driver details, stops, contact number, routes, etc. This application may be widely used by the college students since Android smart phones have become common and affordable for all. It is a real time system as the current location of the bus is updated every moment in the form of latitude and longitude which is received by the students through their application on Google maps. The application also estimates the time required to reach a particular stop on its route. The application uses client-server technology.

A Real Time Transit Tracker for College Bus Unusual and unexpected conditions on the roads affect the smooth operation of the organizational bus systems and the movement of vehicles. Also, everyday problems such as traffic congestion, unexpected delays and irregular vehicle dispatching times take place. As a result of which students and staffs of an organization get affected and they inevitably have to wait for the arrival of their respective bus. A student or a staff waiting for the college bus may want to enquire about the current location of the college bus. This inconvenience can be avoided by introducing Android based bus tracking system which helps to retrieve the location coordinates of the college bus. The main aim of this Android application is to track the college bus which would give the location of bus with the help of Google map and help the users to plan their way to reach their college on time. This application is highly used by the students and staffs of educational institutions since the android mobiles have become common used and it is an easy way of tracking the buses.

College Bus Tracker Android Application Due to many problems in today's world such as traffic congestion, unexpected delays, randomness in passenger demand and irregular vehicle dispatching times, passengers do not know when to expect their buses to arrive. To overcome this, a system can be introduced which will show the real-time location of buses. This project focuses on implementing this system, which uses a real-time bus tracking system. From the global positioning system on the driver's phone on college buses, the location of the bus will be transmitted. This real-time bus tracking system is a system designed with special features to display the real-time locations of college buses provided by the university. It can also be used for many other transportation services.

Bus Live Tracking Using Android Application The main purpose of this project is to develop a real time bus tracking system to enhance current bus service system and reduce the workload of bus management team. The poor services provided by bus service providers are because majority of them are still implementing manual work. Moreover, passengers are impatient while they are waiting in bus stop because they are not able to know exactly how long to wait and where the next coming bus is. Global Positioning System (GPS) is the main technology implemented behind the system. A GPS receiver is used to track on real time bus coordination by continuously receiving the position data which are latitude and longitude values from GPS satellite, then send the position data back to main server and server process the raw position data into real time information for users. This system is implemented on Internet so that passengers are able to view the information through Internet access devices. Methodology applied in this project is prototype development model. The system developed in this project is not modules independently, all modules have to integrate become a working system. Therefore, prototype is developed and use for system evaluations, testing and enhancements. After all modules integration, the system is able to provide a more accurate bus arrival time and to reduce workload performed by bus management team.

III. PROPOSED METHOD

The proposed system utilizes IoT technology to provide real-time bus tracking using GPS and NodeMCU integration. The system continuously records the bus's location and uploads it to the ThingSpeak web application. An Android app fetches this data and displays the bus's real-time location and estimated arrival time. The Arduino microcontroller manages data processing, while an LCD provides local updates. This system improves tracking accuracy, reduces waiting time, and enhances user convenience by offering a reliable, real-time monitoring solution.

College Connect aims to solve this problem by developing a real-time bus tracking website that provides live location updates, estimated time of arrival (ETA), route maps, and alerts for students and staff. The system will leverage GPS

technology and a user-friendly web interface to enhance the commuting experience, reduce wait times, and improve overall satisfaction with college transport services.

Work Flow
College Connect's workflow is designed to provide a seamless and efficient experience for students, staff, and administrators, while improving the overall quality of college transportation services.

• User Registration and Login
– Students and administrators register on the platform.
– Users log in to access their personalized dashboard.

• Bus Route and Schedule Management
– Administrators create and manage bus routes, stops, and schedules.
– Bus drivers are assigned to specific routes.

• GPS Tracking
– GPS devices are installed on college buses.
– Real-time location data is transmitted to the College Connect platform.

• Real-Time Tracking
– Students track their assigned bus in real-time using the website or mobile app.
– Administrators monitor bus locations and routes.

• Notifications and Alerts
– Students receive notifications for bus arrival and departure times.
– Administrators receive alerts for route deviations or other issues.

• Data Analytics
– The platform collects and analyses data on bus routes, schedules, and usage.
– Insights are used to optimize bus operations and improve services.

• Feedback Mechanism
– Students and administrators provide feedback on the platform.
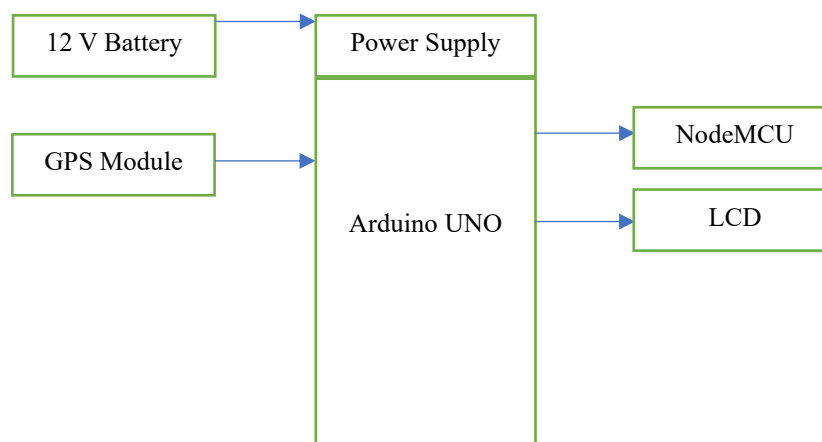– Feedback is used to improve the platform and services.

Fig: Block Diagram

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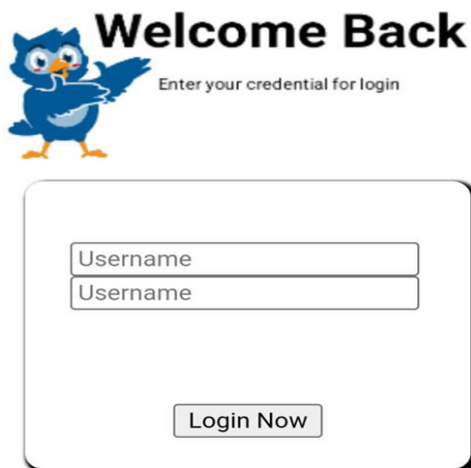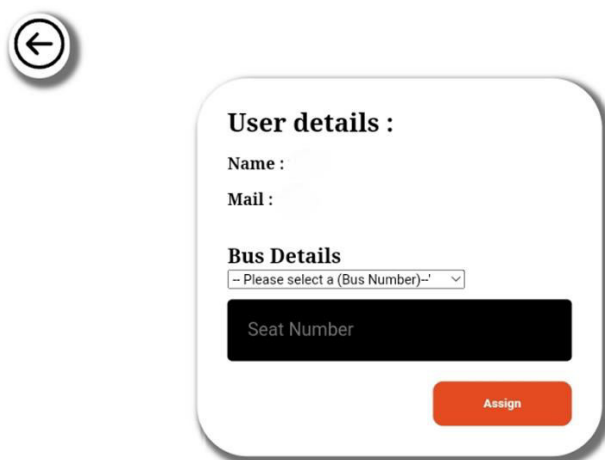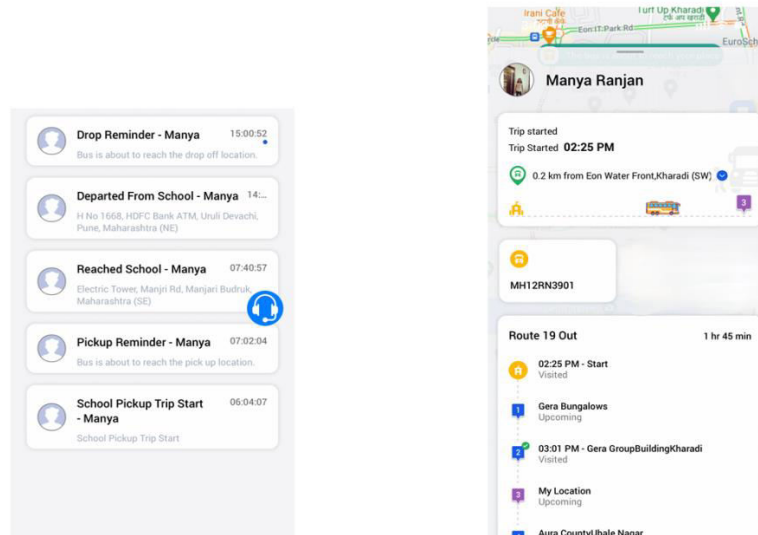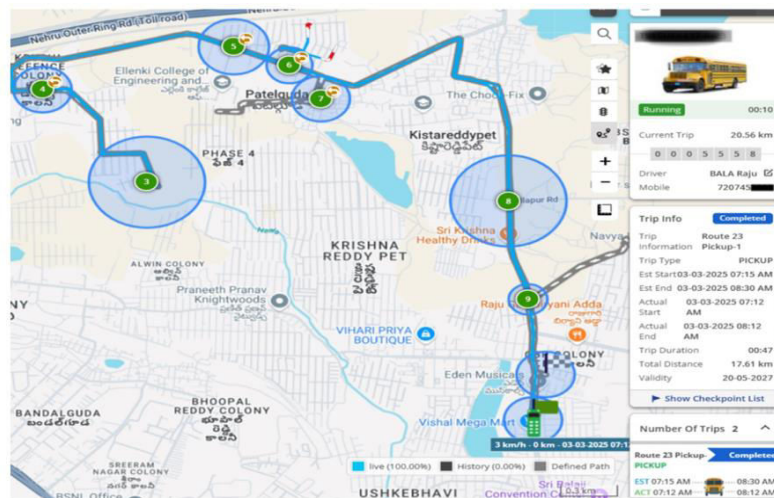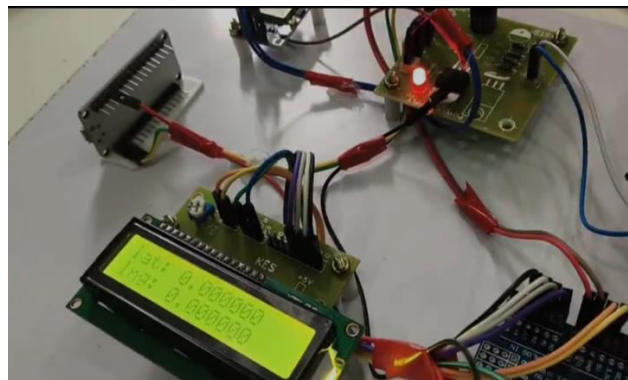
IV. RESULTS

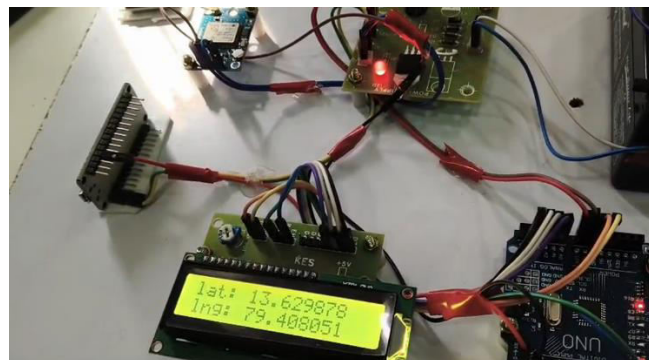Fig 1: Welcome Page

Fig 2: Student Login Page

Fig 3: Admin Login Page

Fig 4: Sample Student Login

Fig 5: Location of Bus on Maps

Fig 6: Initial GPS Data

Fig 7: Data Sent to Webserver

Fig 8: Final GPS Data
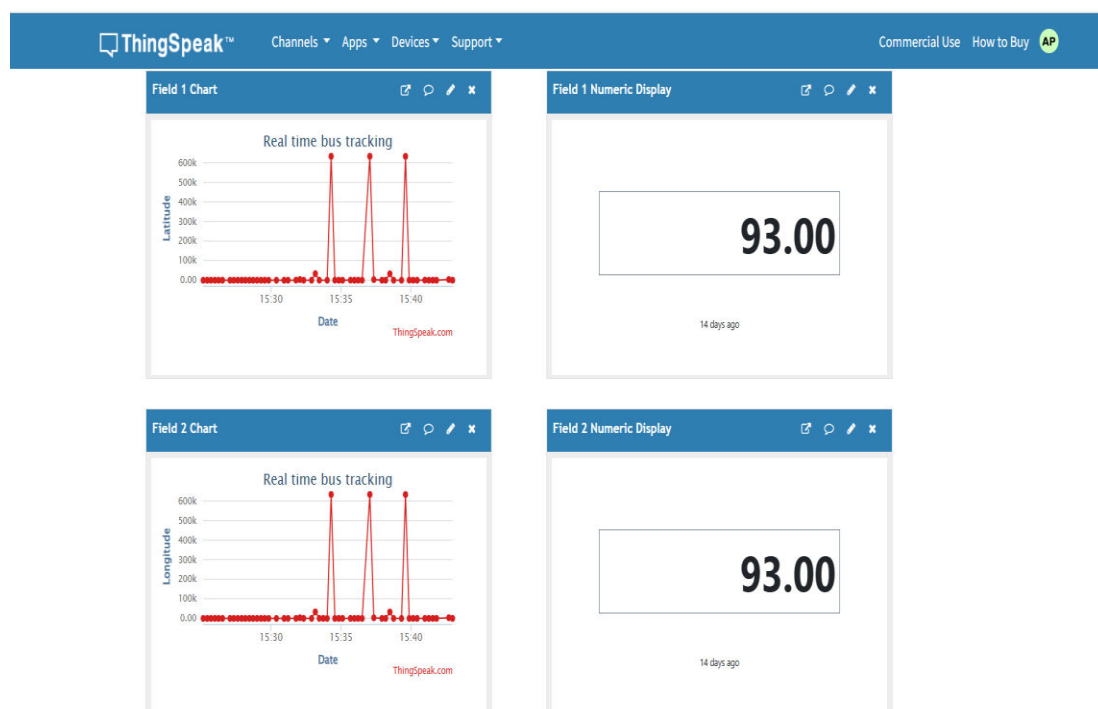
Fig 9: Latitude & Longitude results from ThingSpeak

V. CONCLUSION

A real-time college bus tracking website is a useful tool for students, faculty, and staff to keep track of the location of buses on campus. It can be used to plan schedules, avoid delays, and stay informed about the status of the bus system. The website typically includes a map that shows the real-time location of buses, as well as their routes and schedules. It may also include features such as a search bar, a list of bus stops, and a notification system that alerts users to delays or other important information.

It effectively demonstrates how IoT technology can enhance transportation management in educational institutions. By integrating an Arduino, GPS module, and NodeMCU, the system successfully captures and transmits live location data to the ThingSpeak platform. The use of an LCD for local display and an Android app for user access ensures that both students and administrators can monitor the bus's movement in real-time. This not only improves student safety but also reduces unnecessary waiting times at bus stops. Overall, the project offers a practical, efficient, and scalable solution for modernizing college transportation systems.

REFERENCES

[1] S. Sinha, P. Sahu, M. Zade, R. Jambhulkar, and S. V. Sonekar, "Real Time College Bus Tracking Application for Android Smartphone," *Int. J. Eng. Comput. Sci.*, vol. 6, no. 2, pp. 20281–20284, Feb. 2017.
[2] G. K. Kumar, C. B. Aishwarya, and A. S. Mounika, "College Bus Tracking Android Application using GPS," *Int. J. New Innov. Eng. Technol.*, vol. 4, no. 4, Apr. 2016.
[3] K. Punjabi, P. Bolaj, P. Mantur, and S. Wali, "Bus Locator via SMS Using Android Application," *Int. J. Comput. Sci. Inf. Technol. (IJCSIT)*, vol. 5, no. 2, 2014.
[4] S. Priya, B. Prabhavathi, P. Shanmuga Priya, and B. Shanthini, "An Android Application for Tracking College Bus Using Google Map," *Int. J. Comput. Sci. Eng. Commun.*, vol. 3, no. 3, pp. 1057–1061, 2015.
[5] G. Jemilda, R. B. Krishnan, B. Johnson, and G. L. Sangeeth, "Mobile Application for College Bus Tracking," *Int. J. Comput. Sci. Mobile Comput.*, vol. 4, no. 3, Mar. 2015.
[6] M. Young, *The Technical Writer's Handbook*, Mill Valley, CA: University Science, 1989**.**
[7] MAG. Maureira, D. Oldenhof and L. Teernstra, "Thingspeak an Api and web service", Leiden: [sn], 2016.
[8] F Mohammed, Alrifaie, Norharyati Harum, Mohd Fairuz Iskandar Othman, Irda Roslan and Methaq Abdullah Shyaa, "Vehicle Detection and Tracking System IoT based: A Review", International Research Journal of Engineering and Technology (IRJET).
[9] Chadil, Apirak Noppadol, wang Russameesa and Keeratiwintakorn, "Real-Time Tracking Management System Using GPS GPRS and Google Earth", IEEE 5th International Conference on Electrical Engineering/Electronics Computer Telecommunications and Information Technology, vol. 1, no. 2008, pp. 393-396.
[10] El Gouhary, Richards Amany and Wells-Richard Anthony Thatcher, "GPS Tracking System", 2006.

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