



International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Bus Tracking System

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ABSTRACT

Most colleges provide transportation for students, but keeping tracing of buses, their schedules, and driver information manually can be tedious and error-prone. This paper introduces a smart solution that uses GPS, map APIs, and biometric devices to trace buses and log attendance automatically. The system provides real-time updates, stores data centrally, and generates reports automatically. It also alerts maintenance teams when needed. Overall, it boosts safety, accuracy, and efficiency in campus transport.

Keywords: GPS, Map API, Bus Training, Biometric

Introduction

Many schools and colleges run their buses, which means keeping daily records of routes, trips, drivers, and student pick-ups. Traditionally, this is done manually, which isn't very efficient and can lead to mistakes. Plus, students, staff, and parents don't always know where the bus is, leading to delays and confusion.

To solve this, the proposed system uses GPS and maps for live tracking, and biometric devices for accurate attendance. All information is collected in one place, so that reports can be created automatically, and maintenance reminders sent out. This makes transport safer and more transparent.

Literature Survey

After looking at various sources, we identified key issues in existing bus tracking systems.

- Traditional System

In older systems, parents and students don't get real-time updates. They guess the bus arrival time and wait.

Problems:

- Wastes time
- No live updates
- No way to communicate - Low safety
- Basic GPS System

Some schools use GPS on buses, but they lack apps to show live updates to parents and students. Problems:

- Hard to access
- No alerts or notifications
- Poor user experience

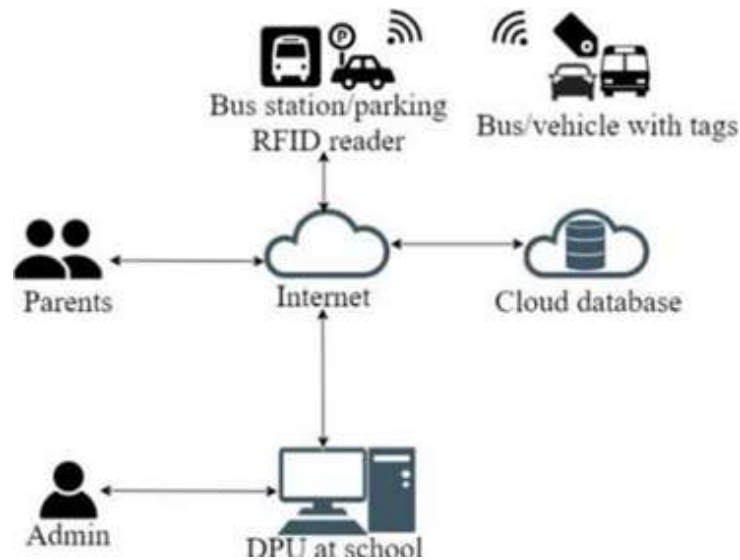


Fig.1 Flow Diagram of Existing system

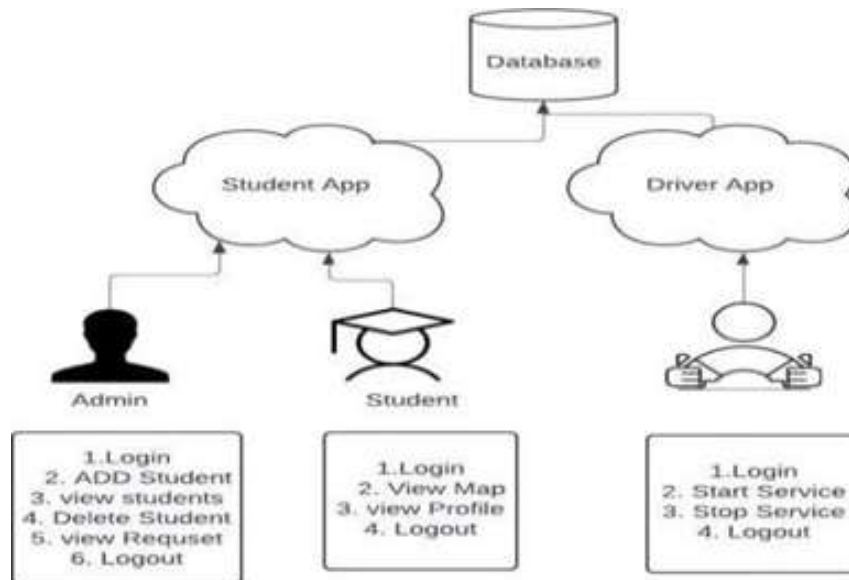


Fig 2: Architecture Diagram

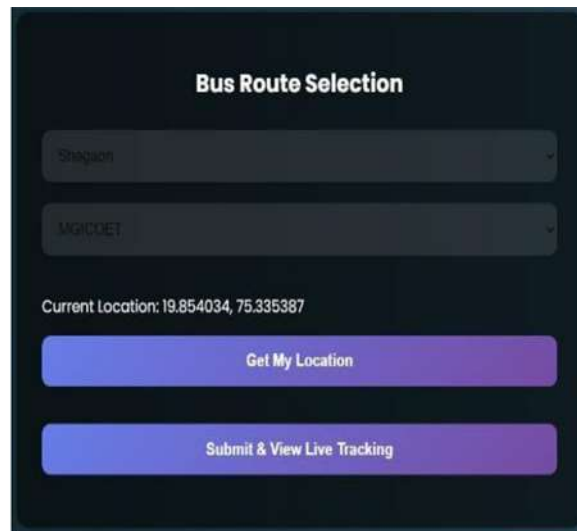
Research Methodology

The system is built as a mobile app with two main user types: - Admins/Drivers

- Parents/Students

Admins register buses and update trip status. Parents or students create accounts to tracing their bus in real-time and get notifications about arrival times, delays, or route changes.

- Roles:
- Bus Driver/Admin:
- Register buses and routes
- Update trip status (start, delay, stop) - Keep information accurate

A dark-themed mobile application interface for bus route selection. At the top, the title "Bus Route Selection" is centered in white. Below it are two dropdown menus; the first is set to "Shagari" and the second to "MIGDOET", both with white checkmarks on the right. Under the dropdowns, the text "Current Location: 19.854034, 75.335387" is displayed. At the bottom are two large, rounded rectangular buttons with a blue-to-purple gradient. The top button is labeled "Get My Location" and the bottom button is labeled "Submit & View Live Tracking".

Bus Route Selection

Shagari

MIGDOET

Current Location: 19.854034, 75.335387

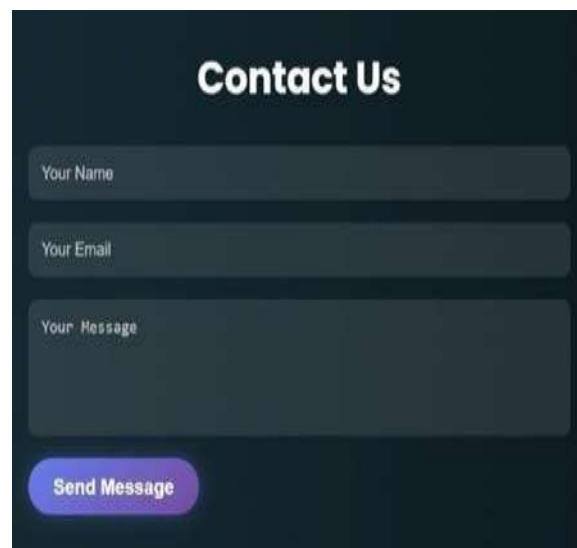
Get My Location

Submit & View Live Tracking



Parents/Students:

- Sign up with email and student details
- Choose their bus route
- Tracing the bus live and get updates.

A dark-themed mobile application interface for a contact form. The title "Contact Us" is centered at the top in white. Below the title are three input fields: "Your Name", "Your Email", and "Your Message". The "Your Message" field is a larger text area. At the bottom is a large, rounded rectangular button with a blue-to-purple gradient, labeled "Send Message".

Contact Us

Your Name

Your Email

Your Message

Send Message

User Interface Features:

Login:

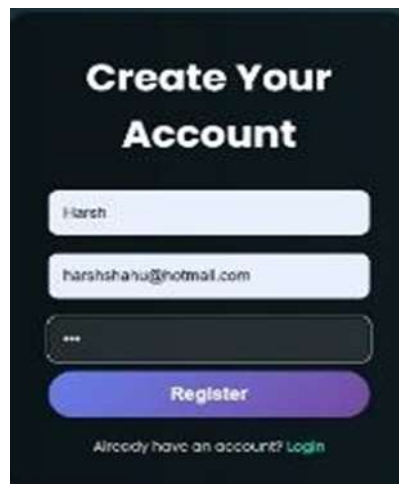
Users log in with email or Google account.



The image shows a login screen for 'Live Bus Tracker'. It has a dark blue background. At the top, the title 'Login to Live Bus Tracker' is in white. Below it are two input fields: 'Your Email' and 'Your Password'. A green 'Login' button is centered below the fields. At the bottom, there is a link 'Don't have an account? Sign Up' and a red error message 'Invalid credentials.'.

Registration:

New users enter name, email, password, and student ID or route number.



The image shows a registration screen titled 'Create Your Account'. It has a dark blue background. There are four input fields: a name field with 'Harsh', an email field with 'harshshahu@hotmail.com', a password field with '***', and a student ID or route number field. A purple 'Register' button is centered below the fields. At the bottom, there is a link 'Already have an account? Login'.

Bus Tracing:

Users select their route or school, then:

- See bus location on a map.
- Get an estimated arrival time
- Receive alerts for any changes or delays.

