IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Vehicle Management System

1st Dhore Shubhangi Suresh
Dept.of Computer Engineering,
Jaihind College Of Engineering
Kuran, India.

2nd Dumbre Gayatri Ramchandra
Dept.of Computer Engineering,
Jaihind College Of Engineering
Kuran, India.

3rd Pokharkar Ratikant Sharad
Dept.of Computer Engineering,
Jaihind College Of Engineering
Kuran, India.

4th Dere Kapil D.
Dept.of Computer Engineering,
Jaihind College Of Engineering
Kuran, India.

Abstract: This paper presents the development of a comprehensive Vehicle Management System designed specifically for educational institutions. The system aims to optimize transportation operations, enhance safety, and improve communication with students and staff.

The system leverages advanced technologies such as GPS tracking and mobile applications to provide real-time information and enhance user experience. By streamlining transportation operations and improving communication, this Vehicle Management System helps educational institutions create a more efficient and student-friendly environment

Keywords- Vehicle Tracking, Bus Start and End Times, Student Notices, Assignment Submission.

INTRODUCTION

In today's rapidly evolving educational landscape, efficient and effective transportation management is crucial for institutions to ensure the safety, convenience, and academic success of their students. The ability to track vehicles, monitor their real-time locations, and communicate important information to students and staff is essential for optimizing transportation operations and enhancing the overall student.

This paper presents the development of a comprehensive Vehicle Management System specifically designed for educational institutions. The system aims to address the challenges associated with managing a fleet of vehicles, providing a centralized platform for tracking vehicle locations, monitoring bus start and end times, disseminating important notices to students, and facilitating the collection of assignments in a timely manner.

The system leverages advanced technologies such as GPS tracking, mobile applications, and cloud-based platforms to enable real-time monitoring and communication. By providing a user-friendly interface and intuitive features, the Vehicle Management System empowers institutions to make informed decisions, improve operational efficiency, and enhance the overall transportation experience for students and staff.

II.OBJECTIVES

A. Enhance Student Safety: Ensure the safety of students by providing real-time tracking of vehicle locations, monitoring bus start and end times, and facilitating timely communication of any incidents or delays

B. Improve Operational Efficiency: Streamline transportation operations by optimizing routes, reducing travel times, and minimizing fuel consumption through efficient vehicle utilization.

C. Enhance Communication: Establish a reliable and efficient communication channel between the institution and students, allowing for timely dissemination of notices, announcements, and updates.

D. Facilitate Assignment Collection: Streamline the process of collecting assignments from students, reducing administrative burdens and ensuring timely submission.

E. Provide Data-Driven Insights: Gather and analyze data on vehicle usage, fuel consumption, and student feedback to identify areas for improvement, optimize resources, and make informed decisions.

III. RELATED WORKS

A. GPS-based Tracking Systems: Numerous studies have investigated the use of GPS technology for real-time tracking of school buses and other institutional vehicles. These systems provide accurate location data, enabling institutions to monitor vehicle movements, ensure safety, and optimize routes

B. Mobile Applications: Mobile apps have become a popular tool for VMS, providing students and parents with real-time updates on vehicle locations, arrival times, and route information.

C. SMS and Email Notifications: SMS and email notifications have been widely used to communicate important information to students, parents, and staff, such as delays, cancellations, and route changes

D. Student Databases: VMS often integrate with existing student databases to provide a comprehensive view of student information, including contact details, emergency contacts, and transportation preferences

E. Assignment Management: Some VMS systems incorporate features for managing assignments, such as online submission and tracking, to streamline the collection and grading process.

IV. PROBLEM STATEMENT

.

Develop a Vehicle Management System (VMS) application to efficiently track, manage, and analyze vehicle usage, maintenance, and performance.

V. PROPOSED SYSTEM

The proposed vehicle management system is designed to streamline and enhance the efficiency of transportation operations within the institute. This comprehensive system will integrate various functionalities to track bus locations, manage student assignments and homework, disseminate important notices, and monitor bus start and end times. Real-time Bus Tracking utilizing GPS technology, the system will provide accurate and up-to-date information on the location of each bus. This feature will enable administrators and students to monitor bus movements, identify potential delays or disruptions, and ensure the safety and well-being of passengers. The system will serve as a centralized platform for managing student assignments and homework. Teachers can easily upload assignments, set deadlines, and track student submissions. Students can access their assignments, submit completed work, and view their grades. This functionality will promote better organization, communication, and accountability among teachers and students. Important notices, announcements, and updates regarding transportation, events, or other relevant information can be easily posted and disseminated to students, parents, and staff. This will ensure that everyone is kept informed and up-to-date. The system will automatically record the start and end times of each bus route. This data can be used for analysis, reporting, and optimization purposes. By tracking bus times, administrators can identify patterns, evaluate route efficiency, and make informed decisions to improve the transportation services. The system will be designed to integrate seamlessly with existing IT infrastructure and other relevant systems. It will also provide a user-friendly interface that is accessible to both administrators and students. The system will be intuitive to navigate, with clear and concise information presented in a visually appealing manner. In conclusion, the proposed vehicle management system offers a robust and comprehensive solution for tracking bus locations, managing student assignments, disseminating notices, and monitoring bus start and end times. By implementing this system, the institute can improve the efficiency, transparency, and overall quality of its transportation services.

VI.METHODOLOGY

The vehicle management system will employ a combination of hardware and software components to effectively track buses, students, assignments, notices, and start/end times**.** Hardware components will include GPS devices installed on each bus to provide real-time location data. These devices will transmit their coordinates to a central server**.** Software components will consist of a web-based application that allows for user interaction and data management. The system will utilize a database to store and organize information related to buses, students, assignments, notices, and routes. Data integration will be achieved through APIs that connect the GPS devices to the central server and the web-based application. Real-time tracking will be

enabled by displaying bus locations on a digital map within the web application. Notifications will be sent to relevant users, such as students and staff, via email or SMS to inform them of schedule changes, delays, or other important updates.

VII. ARCHITECTURE

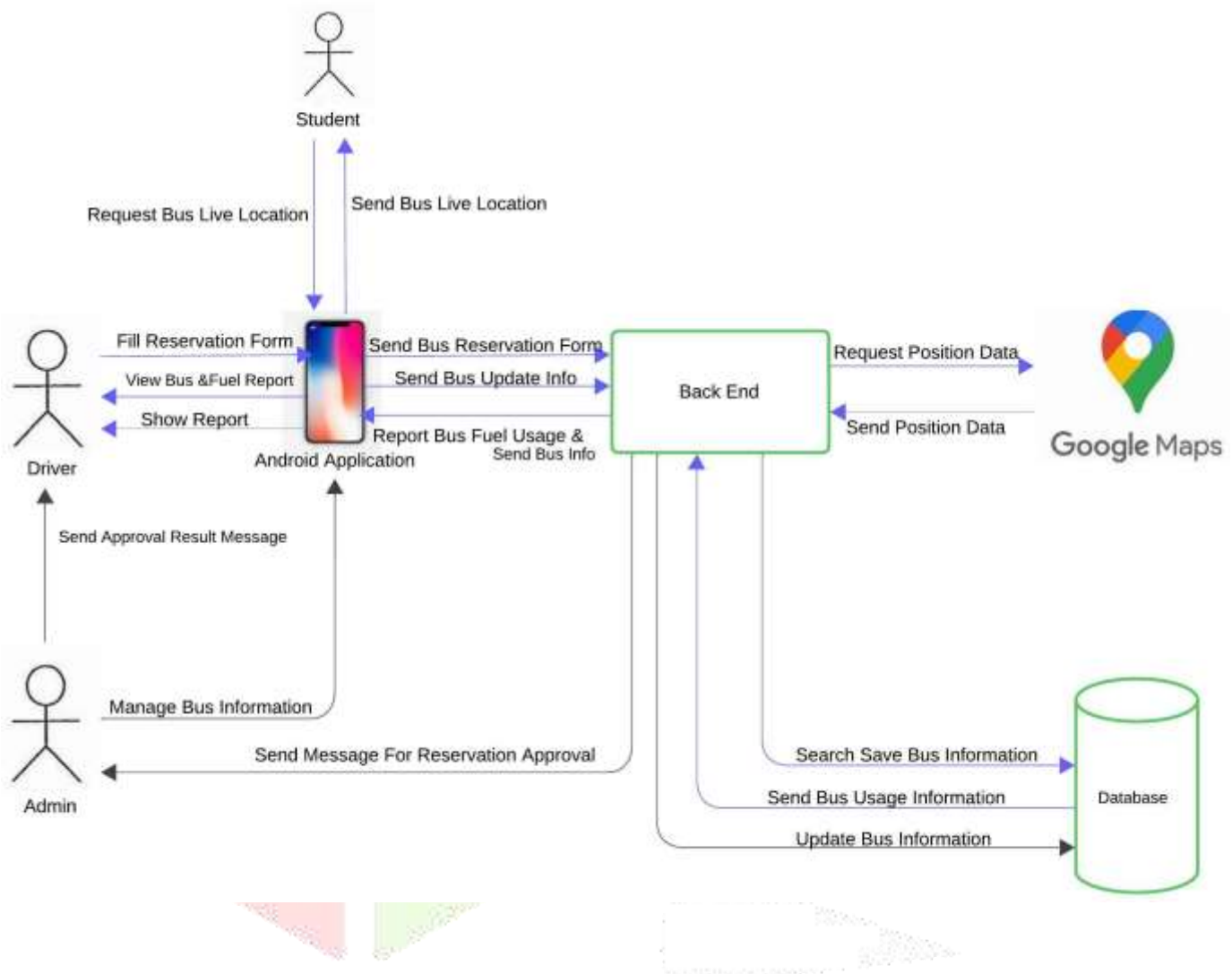

Fig No:01 Architecture of Vehicle Management System

Certainly, let's break down the functionalities of this vehicle management system architecture, considering an institute or organization as the context:

Student:

- **Request Bus Live Location:** Students can request the real-time location of a bus using the mobile app.
- **Fill Reservation Form:** Students can fill out a reservation form to book a seat on a bus.
- **View Bus & Fuel Report:** Students can access reports on bus usage and fuel consumption.

Driver:

- **Send Bus Reservation Form:** Drivers can send bus reservation forms to the back-end system.
- **Send Bus Update Info:** Drivers can update the system with information about the bus's status, location, and fuel usage.
- **Report Bus Fuel Usage & Send Bus Info:** Drivers can report fuel usage and other bus-related information to the back-end system.

Admin:

- **Manage Bus Information:** Admins can manage bus information, including schedules, routes, and assignments.
- **Send Message for Reservation Approval:** Admins can send approval or rejection messages for bus reservations.
- **Search, Save Bus Information:** Admins can search for and save bus information for analysis and reporting.
- **Send Bus Usage Information:** Admins can send bus usage reports to relevant stakeholders.
- **Update Bus Information:** Admins can update bus information in the database.

Back-End:

- **Request Position Data:** The back-end system requests the current position of the bus from the GPS device.
- **Send Position Data:** The back-end system sends the bus's position data to Google Maps for visualization.
- **Search, Save Bus Information:** The back-end system stores bus information in the database.
- **Send Bus Usage Information:** The back-end system sends bus usage reports to the admin interface.
- **Update Bus Information:** The back-end system updates bus information in the database.

Google Maps:

- **Send Position Data:** The back-end system sends the bus's position data to Google Maps.
- **Show Bus Location:** Google Maps displays the bus's location on a map.

Overall, this architecture provides a comprehensive solution for managing bus operations within an institute or organization. It enables real-time tracking of buses, efficient reservation management, and detailed reporting on bus usage and fuel consumption.

VIII.CONCLUSION

The vehicle management system developed for this institute offers a comprehensive solution for tracking buses, students, assignments, notices, and start/end times. By integrating GPS technology, a user-friendly web application, and a robust database, the system provides real-time tracking capabilities, efficient data management, and effective communication channels. The system's ability to track bus locations, manage student assignments, disseminate important notices, and monitor bus schedules has significantly improved the institute's transportation operations. The system has enhanced transparency, efficiency, and accountability

within the institute, leading to improved student satisfaction and overall operational effectiveness. Furthermore, the system's flexibility allows for future customization and expansion to accommodate evolving needs and requirements.

IX. REFERENCES

1. Chiranun Kamolsin, Fuangfar Pensiri , Woramet Rungkul, Chiabwoot Ratanav-ilisagul, Chananon Limpalasuk, Porawat Visutsak, "Vehicle Management System: Fuel, Mileage, Cost, and Maintenance Tracker ", 2023 InternationalConference On Cyber Management And Engineering (CyMaEn).
2. M.S.Rudramurthy, Nitin Hegde ,K Tanmay , Santosh M , Md. Sufian Jawaid,Sushma S A , Keerthan Kumar T G , "Real Time Vehicle Tracking System for Smart Cities", 2023 International Conference on Data Science and Network Security (ICDSNS) .
3. G.Poornima, C. Parthasarathy, K. Umapathy, Dinesh Kumar.T, M.A.Archana,N.AshokKumar, " GPS based Smart Vehicle Tracking and Monitoring System ", Proceedings of the Second International Conference on Intelligent Cy-ber Physical Systems and Internet of Things (ICoICI 2024) IEEE Xplore Part Number : CFP24VG0-ART ; ISBN : 979-8-3315-4066-1.
4. D. Vinotha, R. Vanitha, "Vehicle Management System", International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653.
5. SOHAM SINHA, RICHARD WEST, " Towards an Integrated Vehicle Management System in DriveOS", DepartmentofComputerScience,BostonUniversity, USA and Drako Motors Inc., USA.
6. R. Chauhan, N. Goyal, and R. Kumar, "A Review on Tuning Of OLSR Routing Protocol IN VANET," International Journal of Advance Research and Innovative Ideas in Education, 2, 2016, pp. 508-512.
7. M. A. Al-shareeda, M. A. Alazzawi, M. Anbar, S. Manickam and A. K. Al-Ani, "A Comprehensive Survey on Vehicular Ad Hoc Networks (VANETs)," 2021 International Conference on Advanced Computer Applications (ACA), 2021, pp. 156-160. https://doi.org/10.1109/ACA52198.2021.9626779.
8. H. Chawla and N. Goyal, "Quality of Service and Scalability in Vehicular Ad Hoc Networks," International Journal Of Engineering Research and General Science, 4, 2015, pp. 216-223.
9. C. G. Harrison, "A vehicle management system," IEE Colloquium on Automotive Radar and Navigation Techniques (Ref. No. 1998/230), 1998, pp. 8/1-8/4. https://doi.org/10.1049/ic:19980194.
10. E. J. Lee and K. H. Ryu, "Design of Vehicle Information Management System for Effective Retrieving of Vehicle Location," In: , et al. Computational Science and Its Applications – ICCSA 2005. ICCSA 2005. Lecture Notes in Computer Science, vol 3481. Springer, Berlin, Heidelberg. https://doi.org/10.1007/11424826_107.

11. L. Wu, F. Qiao, and J. Lu, “Design and implementation of vehicle management system based on the ubiquitous network,” 2013 IEEE 4th International Conference on Electronics Information and Emergency Communication, 2013, pp. 297-300. https://doi.org/ 10.1109/ICEIEC.2013.6835510.
12. D. Vinotha, “Vehicle Management System,” International Journal for Research in Applied Science and Engineering Technology, V, 2017, pp. 198-199. https://doi.org/10.22214/ijraset.2017.4039.