

E-TRACKING (Mobile Application for College Bus Tracking)

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Abstract - The college bus tracking system is an advanced solution that uses GPS technology to track the real-time location of the college buses, providing students, faculty, and staff members with accurate and up-to-date information about the buses' ETA and routes. This system consists of several components, including GPS devices installed in the buses, a centralized server that receives and processes the location data, and a web portal or mobile app that displays the bus locations and ETA to the registered users. By using this system, the college administration can manage the bus fleet more efficiently by monitoring the bus utilization rates, on-time performance, and other key performance indicators (KPIs). The system can also generate various reports and analytics that can help the administration make datadriven decisions regarding the transportation system. The college bus tracking system can provide numerous benefits for the college community, such as enhanced safety, improved communication, and better transportation experience. The system can send push notifications or SMS alerts to the registered users regarding any changes in the bus schedules or delays due to traffic, weather conditions, or other unforeseen circumstances, which can help them, plan their commutes more efficiently and avoid any potential danger or delay.

Overall, the college bus tracking system is a cost-effective and reliable solution that can improve the transportation experience for the college community while enhancing the efficiency and safety of the college transportation system.

Keywords: Mobile application, College bus Tracking System, Kotlin and Android Studio.

I. INTRODUCTION

A college bus tracking system is a technological solution designed to improve the efficiency, safety, and overall student experience of college transportation systems. It involves the use of GPS technology and other data analytics tools to provide real-time location information and estimated arrival times for college buses. With this system, students can plan their schedules more efficiently, reducing wait times and stress associated with missed or delayed buses. Additionally, the administration can optimize routes and schedules, reduce transit times, and increase cost savings. The system can also enhance student safety and security by providing real-time location tracking and integration with panic buttons or other safety features. Overall, a college bus tracking system is an investment that can bring long-term benefits to the college and its student body.

To provide the location of buses, mobile GPS of the particular bus driver should be enabled while driving the bus followed the particular user (student or staff) has to enable their location so it will track the distance and provide the estimated arrival time of the route bus of user asked for. E-Tracking will provide you the list of buses numbers and their particular route.

II. ARCHITECTURE DIAGRAM

Architecture is a picture of a system that shows how functionality is mapped onto with each other components, how the software architecture is mapped onto the hardware architecture, and how users interact with these components. It comprises the major physical properties, structure, style, interactions, and purpose of a system.



Figure 1: Architecture diagram for E-Tracking.

A possible workflow for a college bus tracking system could be as follows:

• User registration: Students, faculty, and staff members register for the bus tracking system by providing their personal information and creating a login credential.

• **Bus registration:** The college bus fleet is registered into the system, with each bus assigned a unique ID and its GPS tracking device integrated into the system.

• **Bus scheduling:** The bus routes and schedules are created and updated in the system, indicating the pickup and drop-off points and the estimated time of arrival (ETA) for each stop.

• **Bus tracking:** The GPS tracking devices in the buses transmit the real-time location data to the system, allowing the students and staff to track the bus locations and ETA in real- time via a mobile app or a web portal.

• Notifications: The system sends push notifications or SMS alerts to the registered users regarding any changes in the bus schedules or delays due to traffic, weather conditions, or other unforeseen circumstances.

• **Reports and analytics:** The system generates various reports and analytics, such as the number of passengers, bus utilization rate, on-time performance, and other key performance indicators (KPIs), to help the college administration make informed decisions regarding the bus fleet management.

Overall, the college bus tracking system can improve the efficiency, safety, and convenience of the transportation services, enhancing the college experience for the students and staff members.

III. TECHNOLOGY USED

A. Android Studio:

Android Studio is an integrated development environment (IDE) used to develop Android apps. It provides a range of tools and features that enable developers to build high-quality, functional apps for Android devices.

B. XML (Extensible Markup Language):

XML (Extensible Markup Language) is a markup language used for creating structured documents and data exchange between applications. In the context of developing a E-Tracking application, XML can be used to define the layout and appearance of the app's user interface.

C. Kotlin:

Kotlin is a programming language that can be used to develop Android apps, including E-Tracking application. Kotlin is a statically typed language that is designed to be more concise, safe, and interoperable with Java, which is the primary language used for Android app development.

.D. Firebase:

Firebase is a backend platform provided by Google that can be used to develop and deploy cloudbased mobile and web applications, including college bus tracking system apps. Firebase offers a range of features and services that simplify the development process and provide scalable and secure infrastructure for mobile and web apps.

IV. RESULT

The mobile application is developed using Android app development electric eel version with Android application development. The application implemented with computer system specification of Linux (UBUNTU) version 20.0 operating system, with 256GB SSD and 1TB hard disc with CPU of Intel core i3 7th gen the following steps carried out to develop the mobile application. Implementation Procedure :

Step 1: Launch The Android Studio version electric eel

Step 2: Select the new project option and enter the project name and the recourses will be allocated.

Step 3: Start writing the xml code for UI

Step 4: Update the gradle space with recommend to Firebase and G maps.

Step 5: Start writing code for Backend (KOTLIN).

Step 6: Start building the emulator to run the application.

Step 7: Build the project and run the project Step 8: The output is displayed.

V. CONCLUSION

In conclusion, a college bus tracking system can have significant benefits for both students and the administration. By providing real-time location and ETA information, the system can enhance the student experience, increase safety and security, and improve efficiency and cost savings for the administration. Additionally, the system can provide a platform for enhanced communication between the administration and students, providing updates about important information related to bus schedules, delays, or route changes. Overall, the implementation of a college bus tracking system can help to improve the overall quality of the college transportation system and the student experience. By leveraging the latest technology, the system can provide real-time information, enhance safety and security, and optimize route and scheduling decisions. As such, it is an investment that can bring long-term benefits to the college and its student body.

VI. REFERENCES

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