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SMART REAL-TIME SCHOOL BUS TRACKING MOBILE APPLICATION

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ABSTRACT

Smart Real-Time School Bus Tracking Mobile Application is one of the android application helps to school staff members and parents to detect the current location of the bus in real-time . This application developed for android user only. It display all details like current location, update estimation time arrival of bus, students and drivers details and fees payment mode. This project using GPS Tracker device to transmit all data to the database which is FCM .The GPS helps to fetch the value of longitude and latitude of the current location and send to the database. This project helpful for the user to lead them avoids wasted time to wait for bus. The user can get flexibility of planning travel using the app, to decide when to catch the bus. The application designed to make welfare for the school admin to track the school bus location in a quick manner. The benefits of the application are to view the location of the school bus through map therefore occurring of any accident can be predicted in an easy manner. There are three interactions involved in this application to complete the full process. The system is user friendly and ensures safety and surveillance at low maintenance cost.

Keywords – GPS, FCM, Android, Longitude and Latitude, Surveillance

I. INTRODUCTION

When it comes to public or private transportation, managing buses are difficult task. There are so many variables that can affect when and where a bus show up. There are many various problem occur in the vehicle management system. The bus tracking system uses GPS technology and software application to track the location of buses and provide real-time updates to operate and member.

This solution is especially useful in the context of school buses. A bus tracking system helps administrators and parents keep track of their children's school buses. This is accomplished through integration with bus fleet management software, providing real-time updates on the location of each bus. This allows parents to know exactly when their child's bus will arrive at home ,while administrators can more easily manage their transportation resources. A good system also provide notification of any delays or changes in the schedule. There are several different types of bus tracking system, ranging from simple applications that use GPS data to more sophisticated systems that use sensors and live cameras to track buses.

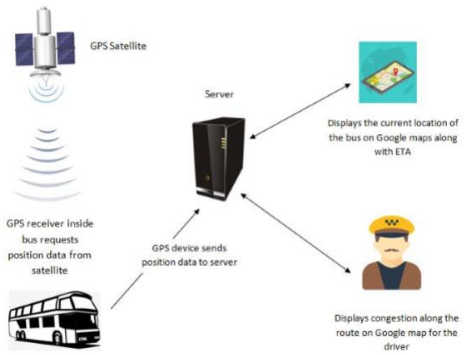

Fig 1.Bus Tracking Architecture

In order to solve these problems and enhance current bus service system, real time bus tracking system has to develop and implement. With real time bus tracking system, bus position data is connected real time and transmitted to a central server for processing and extracting transit information.

The main technology used to develop this system is Global Positioning System (GPS). GPS technology able to receives the position of an object from space-based satellite navigation system through a GPS receiver. For wireless data transmission, GSM and SMS technology are commonly used. The SMS technology through GSM network and GSM modem provide a user with vehicle location information. Instead of using SMS, the bus tracking system uses the smart phone application to track and monitor a bus location obtained from the in-vehicle tracking device. The bus location is automatically placed on Google maps, which makes it easier for tracking a vehicle and provides users with more accurate vehicle location information. The developed bus tracking system will be able to provide bus users a real time platform to check on updated bus traffic information, for example bus arrival or departure time. Many cities have found that GPS tracking system not only improve the efficiency of city bus operation, but also encourage commuters to take the advantage of city bus system. Many city bus systems have discovered that GPS tracking system allows monitoring the location and arrival time of their bus actually increase the number of people using city buses for routine communing.

The application is a user friendly one that anyone can access for free of cost. The basic idea for this project was to guide the bus travelers with the routes, all the possible stops that come on their way to the destination and moreover, display maps and track their locations and show the estimate remaining time required to reach. The aim is to overcome all the drawbacks faced in all the previous applications and generate fast and accurate results.

II. RELATED WORK

Around the world, there are many vehicles tracking system have been developed. These systems have their own uniqueness. An example of EVO GPS Tracker is developed to provide vehicle security and GPS location for personal and fleet vehicle owners. This device combines with advanced technology and safely features to keep the vehicles secured whenever they go. Controlling and Monitoring the vehicles can be done in an easy and convenient way. Live View GPS designed to provide vehicle security and GPS location for fleet vehicle owners. Now they have variety of option to choose either personal, bus, professional vehicle, or all sorts of vehicle tracking system.

They have a device that combines with advanced technology that keep the vehicle secured whenever they are XSSecure XTS Tracking System is GPS navigation engineered for use in vehicles. This device is manufactured in Conjoinix which is a multinational company and a producer of security equipment. It provides huge list of features like, stolen vehicle recovery, asset tracking, video & audio surveillance, transit tracking, fuel monitoring, distance calculation, historic tracking data auditing and etc .

In existing system the tracking of bus can be captured by attaching GPS device to the bus which will be more expensive one. Attaching GPS device to every school bus will be a risky task. The admin of the school can't view the current location and status of the bus, thus knowing the status of the school bus will become a risky factor.

III. PROPOSED SYSTEM

In proposed system to overcome the expenses of attaching GPS, the mobile can be used as a GPS device in sending the current location to the admin. The details of the driver, route and bus are stored in the database. The driver (user) can give unique id to represent the starting of bus. The admin will receive the details of longitude and latitude value of the current location of the bus through application. This can overcome the fault occurrence in GPS devices.

A. Project Description

The project mainly focused on student safety while travelling in school bus. The application was spitted in to two categories as admin application and user application. The admin has rights to add new bus entry under unique bus code. The details of the driver such as driver name, driver id, address and contact no. The bus route from school to various places also added to the database. The admin will allocate the driver to the respective bus route.

The driver will act as a user and thus as soon as the driver enters by giving valid driver id, the location capture will trigger to start. The admin application will receive the longitude and latitude of the location from the user's app. The value will pass towards map to know the location of school bus as per the selected id.

B. Analysis And Design

The interface design of bus information must be as simple as possible so that bus users able to get information easily. The application is divided into three main parts, which is map with bus position, congestion details and emergency. The first segment is the extraction of the information from the API, second is navigation using Google maps for traffic and third is getting the current location and sending SMS. Core operations of the entire system is carried out with these two classes, namely as MainActivity.java and Routes.java

- **Uri and "geo:0,0?q="**

URI(Uniform resource identifier) as its name suggests is used to identify resource(whether it be a page of text, a video or sound clip, a still or animated image, or a program).The most common form of URI is the Web page address, which is a particular form or subset of URI called a Uniform Resource Locator (URL).

Android uses URI string as the basis for requesting data in a content provider (i.e. to retrieve a list of contacts) and for requesting

actions (i.e. opening a webpage in a browser). Intents let you start an activity in another app by describing a simple action you'd like to perform (such as "display a map" or "show directions to the airport") in an Intent object. The Google Maps app for Android supports several different intents, allowing you to launch the Google Maps app and perform one of four actions

- **Location Manager**

This class provides access to the system location services. These services allow applications to obtain periodic updates of the device's geographical location, or to fire an application-specified Intent when the device enters the proximity of a given geographical location.

- **Geocoder**

A geocoder is either a piece of software or a service that implements a geocoding process. The Android API contains a Geocoder class that can use either a location name or a location's latitude and longitude values to get further details about an address (it can perform both forward and reverse geocoding).

Public constructors are: Geocoder(Context context, Locale locale):Constructs a Geocoder whose responses will be localized for the given Locale.Geocoder(Context context):Constructs a Geocoder whose responses will be localized for the default system Locale.

- **Android Studio**

It is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems. It is a replacement for the Eclipse Android Development Tools (ADT) as primary IDE for native Android application development

IV. CONCLUSION

The application helps both the school admin and student welfare. The security can be given by the admin for the school students during the time of travelling in school bus. The google map helps to track the school bus in a simpler manner and therefore occurring of accident or any other disaster can be easily determined by the admin. Each bus details are provided with the unique id, therefore retrieving the respective school bus location will become a simper task.

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