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Bus Tracking System Using Android & Web application

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Abstract*: Transportation has become very difficult in mega cities like Mumbai.The public transport system especially buses are developing around the globe on a rapid scale.such public transports reduce the usage of personal vehicles thereby reducing fuel consumption,trafficcongestion,saving the commuters valuable time and thereby improving his overall travel experience.The problem with the buses in Mumbai is that they are almost everytime not on time.This leads to the commuter waiting at the bus stop for more than 30-35 minutes to board his particular bus.The approximate arrival time of BUSES is known but there could also be delay in arrival thanks to traffic. Seeingthat people started avoiding public transports and started using non-public vehicles, many applications were developed; butthese applications were unable to mitigate the problems. Some applications provided only the arrival time and point in time of BUSESat their supply and destination. Some of them, provided time-tables, but even they weren't correct asthey failed to contemplate thedelay thanks to unpredictable factors like – traffic, harsh weather situation, etc. The time-tables were not timely updated leading towaiting for BUSES.And thanks to of these reasons commuters want completely different alternatives to ally their problems. There are systems that arecreated to satisfy the user's needs; the chapter two can provide the knowledge on a number of those systems, also their advantagesand disadvantages.*

I. Introduction

Android is the emerging technology in the world today. Most of us own an android handset. Our lives have becameconvinient and easy owing to some famed applications with their functional tactics. In this case expecting the buses isn'treliable. People who rely on the public transport like majority if not all students and office-goers their major concern is to know the time and location of the bus thatthey're expecting and also the time it'll take to reach their bus stop. This information helps commuters in creating higher traveling selections.The application is packed with very interesting and impressive features. It provides the travellers with real-time notifications and information about the bus. It makes recognizing and finding of a bus a true simple task. The application even lets a user toseek out the closest stop from their current location through their phone's GPS. In order to make travelling by buses easier andworry free, the applying provides the user with the route maps of the path. It even provides them information like distance and number of stops about the bus. Now-a-days, many people have Smartphone in their hands and a active data connection.With which they can whenever check the bus ETA and plan their travel accordingly and improve their overall travel experience

II. Literature Survey

[1]Many passengers are late to work, students are late for classes as a result they decide to expect the bus rather than simplymerely using another transportation. A variable message shown on the web will be real time information regarding the bus showing the time of arrival at a particular bus stop might bring back the anxiety of passengers expecting the bus. With the arrival of GPS and also the omnipresent cellular network, real time vehicle tracking for higher transport management has become attainable. These technologies can be applied to conveyance systems particularly buses, which are not ready to stick topredefined timetables owing to reasons like traffic jams, breakdowns etc. The increased waiting time and the uncertainty in busarrival build transportation system not pleasing for passengers. The real-time bus position and time watching system uses GPS technology alongside totally different application to fetch knowledge and with code that displays the information online on with different buses on a route to the user. When this information is bestow on to the traveller by wired or wireless media or online internet media, they use their time with efficiency and reach the stop before the bus arrives, or take another means of transport if the bus is delayed. They even arrange their journeys extended before they really undertake them. This will make the general public transport system competitive and passenger- friendly. The use of private vehicles is reduced when additional individuals use transitional vehicles, which in turn reduces traffic and pollution.

[2]The Real Time Bus Monitoring and Passenger Information bus tracking system will work as a workable notification system that will effectively help pedestrians in making the decision of whether to wait for the bus or walk. This device is a standalone system designed to display the real-time location of the buses in Mumbai. The system will consist of a trans module installed on the bus, receiver boards installed on the bus stops, LED embedded map of the BEST bus transportation routes at the centralized controller. It will also have passenger info system software installed at bus stops, which will provide a user the applicable

information regarding all the bus numbers going for his source to end of the line along with the path details and the cost. Congregation of these modules enable tracking device to obtain GPS data from bus locations, which will then transfer it to the centralized control unit and portray it by activating LEDs in the approximate geographical location of the buses on the route map. It will also transmit its bus numbers and route names continuously as soon as bus comes within the span of the receiver at the bus stop. In addition, the device will be portable and defensible; it will not require an external power source, which will remove long-term energy costs

[3]This Paper is a study to implement a method that makes transport much suitable for individuals who travel daily using the public bus transport of the city, for proper time management and making it trouble free, not just for travellers but the Transport Department to create an efficient public transport system. There are applications available in the market now a days which specify the route and the timings, forecast arrival times of other buses. But the study showed aims to build application that takes

it to the next step by making information about the empty seats and the current location of any bus in Real-Time, available to the everyday travellers with a novel and low cost wireless system. These procedure offer increasing improvements in bus system to meet the capacity requirements of different size cities and presents a review of ways which can be employed to satisfy public transport demands of different city sizes. Their aim is to build a adjustable, comfortable, easy available and reliable bus service which may persuade shift from private vehicles to public transport.

III. Overview Of The Proposed System

3.1 Problem Statement

To design web based application to the users who want real time information about the Estimated time of arrival (ETA) of buses at the bus stops. Use to give control to the server to share the calculated ETA to bus passenger through any convenient way.

3.2 Architecture of Proposed System

The system is operated by the GPS which is attached to the bus. Firstly it receives the satellite signals and then the position coordinates with latitude and longitude are estimated. This system used Automatic Vehicle Location (AVL). By using AVL the geographic location of a vehicle is determined and this data is transmitted to a remotely placed server. With the help of GPS and trans mechanism, the location is estimated. The data is received by satellite or a terrestrial radio cellular connection by the bus to a radio receiver. After receiving the location the tracking info can be transmitted using wireless communications systems. This system uses GSM to transmit the info. A remote user can access the data on a bus based on user's supply as well as destination. The suggestion system provides the perfect location of the bus. Bus shadowing technology is an advantage for tracking and observing a bus. The proposed system consists of three vital modules:-

1. Bus Unit
2. Central Control Unit
3. Client-Side Application

In bus unit-Bus has GPS device attached to it and it sends its coordinates i.e. longitude and latitude after every predetermined interval of time to the main server. To use GPS there are no fees or setup charges. To determine the position, GPS receiver is able to receive signals from three satellites. It depends on the kind of application the GPS transceivers may be a data Loggers, data Pullers. This device receives GPS information and send the data at particular interval of time to the server. On receiving, the server analyses the data.One slot is allotted for SIM card and it receives the signal from the GSM towers to respond to the users. The positive and negative wires are connected to 12V or 24V vehicle power system. Then to receive the signals from the satellitetracker device is on. Now the device is able of receiving the latitude and longitude values of the position of the bus. At any point of time, the GPS receiver gives the location. Now the bus unit has the coordinates with a timestamp which is then compared to the before coordinates and if there is any well-defined then the coordinates are updated and sent to a server over GPRS network

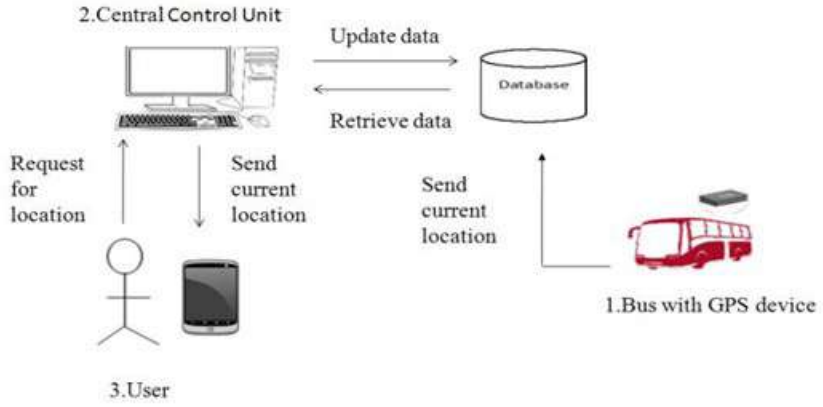

Fig -1: Architecture of proposed system.

The location details are stored on a server in the form of such as ID, longitude, latitude, timestamp, etc. To determine every bus among the diverse buses here ID is taken. Each bus is given one characteristic identification number. The server is the most significant module during this system which acts as a central archive of the system. In this system, whole information is stored and maintained by the server. The server is between bus module and user module. These databases consist of real-time information Concerning bus it includes bus routes, actual arrival/departure time and real time location of the bus.

The user side module is nothing but an bilateral web-based application that services the various function of the system to remote users. The user side module takes two inputs i.e. one is source that indicates wherever the remote user is now and other sis the destination user wants to travel to. When a user sends request the device fires a query to the server to access the data stored within the server database and provides a list of attainable buses in keeping with remote users supply and destination. Now it's user's task to choose or select accurate bus range to understand the real time location of the bus or other information. After choosing an accurate bus number the application shows the real-time location of that bus on the user screen. This application collaborates and interacts with varied clients to offer service to user's requests. The system simplifies the real-time pursuit of the bus.

IV. Work flow Of The Sysytem

In this module the driver will login from his Android device by entering his login details .After login he will enter his location and bus details before starting from the source bus station and location will be continuously fetch by using google distance matrix api and it will show the estimation time of arrival by calculating the distance from the current bus location and destination bus stop .The passengers which are waiting for the bus to catch will get real time update of the bus through LCD device which will be located at the bus stop The LED will consist of details likes the bus number and the expected time of Arrival of the bus to reach the bus station .

HARDWARE REQUIRED
1- Arduino
2- LCD Display
3- Wi-Fi Module

SOFTWARE REQUIRED
1- JAVA JDK
2- 2-ANDROID STUDIO 3.1
3- ASP.NET

V. Conclusions

We have developed an Android Application to track the buses and provide relevant information of their positon at theBus Stop This paper has described the design and architecture of our bus tracking system. Our system is composed of smart phones and a server. The system is able to demonstrate its performance to track bus from any area.

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