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Real-Time Bus Tracking System

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ABSTRACT

The Real Time Bus Monitoring and Passenger Information bus tracking device is a system that is designed to display the real-time location of the buses in metropolitan cities. This bus tracking device will serve as a workable notification system that will effectively assist passengers in making the decision of whether to wait for the bus or to go for another option. The system will enable the tracking device to obtain GPS data of the bus locations, which will then be transferred to a centralized control unit. This system will contain transmitter module which will be installed on the buses, receiver boards installed on the bus stops, map of the bus transportation routes at the centralized controller. It will also have the information system software installed at the bus stops which will provide the user, the relevant information regarding all the bus number going from his source to destination and also the route details. The existing system find it difficult to stick to the given time schedule and reschedule its time if the bus is stuck in traffic or is late due to congestion of roads. The proposed real time bus monitoring system helps to overcome the disadvantage of this already existing system. The modules assemble will enable the tracking device to obtain GPS data of the bus locations. It will also transmit the bus number and its route as soon as the bus comes within the range of the receiver.

Keywords : GPS, Real Time Bus Monitoring, LED, GPRS

I. INTRODUCTION

As per our knowledge, mostly we find ourselves getting stuck on the bus stop wasting our time waiting for the bus. The reason behind the delays of the bus is mostly due to traffic congestion and various other reasons such as adverse condition of the roads, waterlog and many other relevant things.

As a result, many passengers often get late for their work or any other planned schedules because of this delayed timings. Consequently, their work gets affected. Several passengers also wait in a long queue for their bus for longer period of time. Thus to reduce this confusion and inconvenience, we are developing the system called 'Real- Time Bus Tracking System'. As we know, many of us love the real time application, because we actually use them in day-to-day life. Thus, it is actually very helpful to stay connected and stay informed about the actual location of the bus. By getting this information about the availability of the bus, people can decide whether they have to wait for the bus or they should go for another option for commencing their journey. So, it also helps to save the time. It also provides us the timetable of the buses in the list form. This system uses GPS (Global Positioning System) technology to fetch

up the data. It is online web media. This system provides real-time location of the bus on user interface. It is a user friendly application.

II. LITERATURE SURVEY

Article 1: 'Real Time Bus Position and Time Monitoring System' IJSTE-International Journal of Science Technology Engineering, Volume 1, Issue 10, April 2015.

Many passengers usually get late to their work, due to their decision to anticipate the bus rather than simply using another alternate transportation. A variable message shown on the web which will be real time info regarding the bus showing the time of arrival at a particular bus stop might scale 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 transportation systems particularly buses, which are not ready to stick to predefined timetables owing to reasons like traffic jams, breakdowns etc. The increased waiting time and the uncertainty in bus arrival build transportation system unattractive for passengers. The real-time bus position and time observance 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 special route to the user. When this information is given to the traveler by wired or wireless media or online internet media, they can use their time with efficiency and reach the stop simply before the bus arrives, or take alternate means of transport if the bus is delayed. They can even arrange their journeys long before they really undertake them. This will build the general public transport system competitive and passenger- friendly, thereby reducing the use of personal vehicles, which in turn reduces traffic.

Article 2: M. B. M. Kamel, 'Real-time GPS/GPRS based vehicle tracking system,' International Journal Of Engineering And Computer Science, Aug. 2015.

The Real Time Bus Monitoring and Passenger Information bus tracking device will serve as a workable notification system that will effectively assist pedestrians in making the decision of whether to wait for the bus or walk. This device is designed to display the real-time location of the buses in Mumbai city. The system will consist of a transmitter module installed on the buses, 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 information system software installed at the bus stops, which will provide a user the relevant information regarding all the bus numbers going for his source to destination along with the route details and the cost. Assembly of these modules will enable the tracking device to obtain GPS data from the bus locations, which will then transfer it to the centralized control unit and depict it by activating LEDs in the approximate geographic positions of the buses on the route map. It will also transmit its bus numbers and route names continuously as soon as the bus comes within the range of the receiver at the bus stop. In addition, the device will be portable and sustainable; it will not require an external power source, which will eliminate long-term energy costs.

Article 3:'Real Time Availability System' International

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This article is a survey to implement a method that make the transport much convenient for individuals who rely daily on the public bus transport, for effective time management and making it trouble-free, not just for the commuters but the Transport Department to create an efficient public transport system. There are applications available in the market today which specifies the route and the timings, predict arrival times of different buses But the survey presented here aims to build an application that takes it to the next step by making information about the vacant seats and the current location of any bus in Real-Time, accessible to the daily commuters with a novel and economical wireless system. This methodology offers incremental improvement in bus system to meet the requirements of different cities and present a review of those strategies which can be employed to satisfy public transport demands of different cities. Their aim is to build the flexible, comfortable, easily available and reliable bus service which will encourage general passenger towards public transport.

III. OVERVIEW OF THE PROPOSED SYSTEM:

3.1 Problem Statement

To design the android based web application for the passengers who want to get acknowledged about the real location and the arrival timing of the bus, through the convenient way.

3.2 Architecture of Proposed System

This system is been operated by the GPS which is attached to the bus. This system uses Automatic Vehicle Location, through which the geographical location of a vehicle can be determined and this data can be transmitted to a remotely placed server. With the help of the GPS and transmission mechanism, the location of the bus can be determined. The data can be received by satellite or a terrestrial radio cellular connection from the bus to a radio receiver. Generally, a remote user can access the data on a bus based on user's supply and destination.

The proposed system will provide the exact location of the bus. Bus tracking technology is advantageous for tracking and monitoring a bus.

The proposed system consists of three vital modules:-

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

In bus unit, a bus has GPS device attached to it that sends its coordinates i.e. longitude and altitude after every fixed interval of time to the main server. To use GPS there are no subscription fees or setup charges. To calculate the position, GPS receiver is capable of receiving signals from at least three satellites. Depending on the kind of application the GPS transceivers may be a data Loggers, data Pullers or Data Pushers. This device receives the GPS information and sends the data at regular intervals to the server. On receiving, the server analyses the data. To receive signals in the appropriate place, the GPS antenna is connected

to the right jack and fixes the antennas. One slot is allocated for SIM card and it receives the signals from the GSM towers to respond to the users. The positive and negative wire is connected to 12V or 24V vehicle power system. Then to receive the signals from the satellite the tracker device is turned on. Now the device is capable of receiving the latitude and longitude values of the location of the bus. At any point of time, the GPS receiver gives the location values. Now the bus unit has the coordinates with a timestamp which is then compared with the previous coordinates and if there is any distinction then the coordinates are updated and sent to a server over GPRS network (internet).

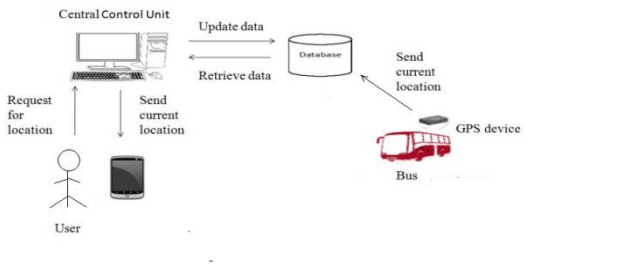

Fig -1: Architecture of proposed system.

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

The user side module is nothing but an interactive 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 the source that indicates wherever the remote user is now and second is the destination user wants to travel. When a user sends a request the appliance fires a query to the server for accessing the data stored within the server database and provides the list of obtainable buses in keeping with remote users supply and destination. Now it's user's task to choose or select explicit bus range to understand the real time location of the bus or other information. After choosing an explicit bus number the application shows the real-time location of that bus on the user screen. This application gives support and interacts with varied clients to offer service to user's requests. The system facilitates the real-time pursuit of the bus.

IV. WORKFLOW OF THE SYSYTEM

The workflow of this system proceeds as follows: First, the GPS module which is fixated in the bus starts sending data in the form of latitude and longitude which is stored in the computer system. User can login to the system and can enter the source and destination of the bus number of which it seeks the location. This search will result in the all the bus routes through which the bus will travel. Alongside, the computer system will update the longitude and latitude of the required bus. This search will then look up for the range of bus from the user to its current location. If the bus is in range, the search also looks up for the in-between bus stops and the active buses in that particular range. After this, it matches the bus location with the passenger's source location and calculates the time required for the active bus to reach the

passenger location. The GUI will display the bus location and the estimated time of arrival to the user. This process follows a repetitive cycle for every search performed by the user.

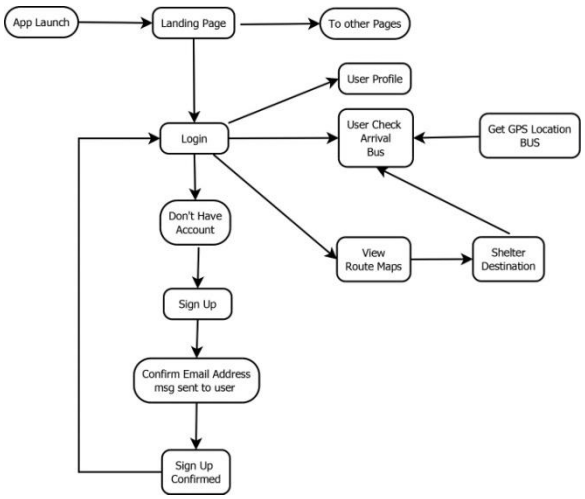

Fig -2: Workflow diagram

V. CONCLUSION

With the development of this project, a complete track of the buses can be viewed. By implementing this real-time tracking system, passenger can get acknowledged of the location of bus and thereby deciding his/her journey more precisely to whether wait for the bus of to choose another option of transportation. This system also gets us acknowledged about the frequency or availability of the buses. Thereby reduces the length of the queue of those who are waiting for buses. It also gives the traffic delay information and real traced maps of the routes. It uses GPS system for tracing the location. In today's world, we see, everyone is attached to the internet-enables mobile phones. So it actually helps people to stay connected with systems and let the user know the status of the routes which we help passenger to plan their journey more effectively.

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