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Real Time Monitoring Of DTC and Alert Generation

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Abstract- *A lot of people in Delhi rely on public transport especially on DTC buses, as it is easy, affordable and available in almost each corner of Delhi. DTC is one of the major means of public transportation in Delhi.It has been experienced and analyzed that people in Delhi face many problems like rush in the buses, delay in getting the buses and many other problems while using DTC buses.*
One the major problem is that, people waste a lot of time in waiting for the bus to board. This is because of lack of real time information available to them. They don't actually know that how long will it take to get a bus after leaving their home or office, and therefore they leave early keeping some marginal time.To get rid of the problems stated above, we are going to design a smart system that shall help people to get the Real Time Information of the bus which they want to board at the time they want. The information is delivered in form of alerts generated by the smart system on the basis of current location of bus and the commuter.

Key Words: GPS, Bus-positioning, Location-tracking, Real-time.

1. Introduction
2. Components and their use in the system.
3. Proposed Solution.
4. Algorithms
   4.1 Algorithm to find the availability of bus at a particular bus stop.

   4.2 Algorithm to generate alerts.

5. Future scope.
6. Conclusion.

Introduction

In the daily operation of DTC buses, the movement of vehicles unlike vague conditions as the day proceeds, unexpected delays due to traffic congestion, Road jams Failure due to technical reasons and some other problems, Many people are often late to office; students are late for colleges and schools because wait for the bus. To make this system more user friendly; We propose a smart system that will be accessed through smartphones. Real time bus tracking for better transportation system has become possible with the help of cellular network and GPS system. We can utilize these technologies in public transportation, especially buses, which generally fails to stick to scheduled timetables due to reasons like breakdowns, traffic jams etc. Passengers don't find public transport system reliable because of uncertainty about the bus arrival. As stated above our system uses the GPS location to track buses in real time. To manage the time of passengers efficiently and to get the desired bus information on time the system generates alerts, So that the journey of the passengers can be planned a way before they decide to take on it. Our system will create friendly relationship between passenger and transportation system. This will help people to confidentially rely on the use of public transportation system and hence will reduce waiting time, traffic and pollution as well.

Problem Statement

In the current system of DTC bus transportation, there is no way to get the Real Time Information of the current location and the availability of bus at a particular bus stop; therefore many people waste their priceless time in waiting for the bus at bus stops.

Although the buses are generally dispatched on time from their original point, but because of the unexpected problems faced in between journey, the buses are not able to follow the actual time table.

There are many uncertainties that cause problems in seamless transportation system like: Road jams, Accidents, Failure due to technical reasons etc…

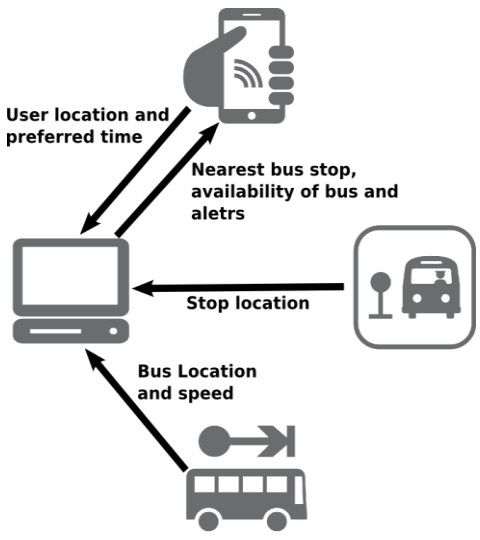
Some people try to get the information about the bus from their friends and colleagues who are travelling in the same bus, but this method can't help the people who are travelling alone.

A lot of time can be saved if all the Real Time Information of the buses is made available to the passengers. They can schedule their time and work accordingly.

The system will minimize the waiting time of passengers which they spent on bus stops and also it will help in seamless transportation system, and encourage the people for giving priority to use the public transportation more confidentially over private vehicles, and hence the system will indirectly produce a remarkable impact on minimizing the pollution in the city.

Components and their use in the system

1. **Smartphone-**To get the current GPS location of the passenger.
2. **Bus Stop-**GPS location of the bus stop (to find the nearest to passenger).
3. **Bus Location and Speed-** To calculate the approximate time to reach a particular bus stop.
4. **Central System-** To find the availability of bus at a particular bus stop and generate alerts when the bus is about to reach that bus stop, on the basis of passenger's time preferences.



(Fig 1 - System overview)

Proposed Solution

The solution is to make the Real Time Information available to the commuters on their prioritized time.

To solve the problem smartly, we need to get the current GPS location of passenger, bus and bus stop.

The GPS location of passenger and bus stop help us to find the nearest bus stop to the passenger from where he/she can board the bus, get availability of bus at the bus stop on the basis of previous bus record at the bus stop.

The current location, speed(calculate at real time) of the bus and the location of bus stop is used to calculate the approximate time to reach at a particular bus stop.

The system will generate and send alerts to the passengers when the bus is about to reach their nearest bus stop.

Algorithms

The solution is based on the following two algorithms:

1. To calculate the availability of bus at a particular bus stop.
2. To generate alerts when bus is about to reach at the bus stop.

1. Calculate the availability of bus at a particular bus stop

Input values-Geolocation of user and bus stop, user's preferred time.

Output-Availability of bus at the user's preferred time.

Steps involved in the algorithm

1. Calculate the distance between bus stop location and user's location by using Haversineformula[1].
2. Calculate the nearest bus stop from the distances calculated in step 1.
3. Find the bus timings of nearest bus stop resulted from step 2.
4. Generate availability alerts on the basis of the result of step 3.

2. Generate alerts when the bus is about to reach at user's bus stop

Input values-Distance between user's bus stop and bus, current speed of the bus.

Output-Approximate time to reach user's bus stop.

Steps involved in the algorithm

1. Apply speed formula[2] on the bus speed and the distance between bus and the bus stop to find the approximate time to reach user's bus stop.
2. Send alerts to the user if the time to reach the bus stop equals user's alert time.

Future Scope:

The current system has been proposed on the basis of problems faced in Delhi while using public transport system especially DTC buses. It can also be implemented in all the cities where same problems are encountered.

Conclusion:

The system will provide real time information on their prioritized time and help the commuters to take right decision at right time and on the basis of information delivered by the system to them.

It will also help to minimize the waiting time to minimal possible time, and will make the transportation system more reliable and attractive to the users.

It will also encourage people to prefer public transportation system over private vehicles, and will leave a remarkable impact in reducing the increased pollution in the city.

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[1]https://en.wikipedio.org/wiki/Haversine_formula

[2] https://en.wikipedia.org/wiki/Speed

[3] http://www.flaticon.com

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