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A Real-Time Bus Tracking System

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ABSTRACT

In cosmopolitan cities, people are highly relying on public transport. Every passenger wants to know the bus arrival time. The schedule of buses and other vehicles may get affected due to uncertain conditions. The poor condition of roads often affects the movement of the bus. Buses and other vehicles running along the same route at the same time result in unreliable service and more effective wait times than scheduled. Atmospheric conditions highly influence bus ridership. In the rainy season, waterlogging highly affects the bus speed and schedule. The passenger also has to face the cancellation of public transport due to waterlogging. Because of these constraints, Passenger gets late to reach their respective workplaces.

Keywords - GPS, Automated Systems, Data Mining, Bus Tracking, Traffic Congestion, Unexpected Delays, Schedule

1. INTRODUCTION

Public transport is an essential part of every country. In this rapidly changing and growing world, people are always in a rush to reach their workplaces on time. In urban areas, office staff and school kids prefer to travel by bus transport. To know the bus timings, bus numbers, the bus route is the most crucial and basic information that each passenger should know. Due to the lack of this information, It gets difficult for people to manage the schedule and reach on time to the bus stop. A passenger has to wait at the bus stop without having any idea about the arrival time of the bus. Several constraints like the traffic jam, sudden delay, weather conditions make a huge impact on the performance of bus transportation. This inconvenience can be diverted by designing real-time bus tracking system. A Bus tracking system can be executed using GPS Functionality. GPS System can provide all crucial specifications, which are necessary for the best tracking result.

Our proposed system places the GPS on the bus.GPS tracking system tracks the bus location, bus route ,bus arrival time and informs the central storage unit. Once this data gets stored in storage unit. From the storage unit, this information gets uploaded on the server. passengers can access this data using the web-based application anytime and anywhere. With the help of this data, Passengers can manage their schedule efficiently. School buses can find the shortest and best routes on a real-time basis. This system will make the school transportation system time saving and reliable.

2. LITERATURE REVIEW

Many people proposed the designs for the implementation of real-time bus tracking system. [1] Author "Christeena Joseph, A.D.Ayyappan, A.R.Ashwini,B.Dhivya Bharathy" proposed GPS/GSM based bus tracking system. The system consists of tracking device contains GPS/GSM & microcontroller. The location name is saved in the microcontroller table. The system tracks the location of the vehicle. The paper is divided into five major parts. The first part is information about GPS/GSM system. The second part is based on the problem in the existing system. The third part provides an analysis of some of the existing systems. The fourth part provides the methodology of system. The last part consists of implementation and testing.

[2] Author "Sulaima Lebbe, Abdul Haleem and Samsudeen Sabra Nawaz" proposed real-time bus and scheduling system using wireless technology that consists of RFID and Arduino microcontroller board. The proposed system provides information about bus location, bus arrival and departure time from each bus stop.

3. OVERVIEW OF PROPOSED SYSTEM

3. 1 Problem statement

To design a real-time bus tracking system this will increase the quality of public transport

3.2 Solution

Our framework gives significant data with respect to all transport numbers going from client's source and destination along with bus route information, arrival time and bus location. Our framework is worked by GPS, which is joined with the transport. Initially GPS gets the satellite flag and afterward, the position co-ordinates with scope and longitude are dictated by it. The location can subsequent to accepting the information the following information can be transmitted utilizing any remote correspondences frameworks. GSM/GPRS is utilized for the most part to transmit the information. By a large remote clients can get to this data of a transport dependent on clients source and goal. our proposed framework gives the ongoing area of transport. Transport following innovation is beneficial for following and checking transport.

3.3 Hardware and Software Requirements

The system has both hardware and software requirements-

3.3.1 Hardware

Fig.1 GPS device

GPS device is the hardware part which need to be fix inside the bus. This device provide the location of the bus. Based on which system can predict the arrival time of the bus. This device can work in any weather conditions.

3.3.2 Software

The web is application is designed to provide the information about the bus to the client. It contains all the information like bus routes, arrival & departure time, bus location.

3.4 Architecture of the proposed system

The proposed system has three modules-

3.4.1 Bus Module

The location of the bus module is tracked by installing a Global positioning system transceiver on the bus. GPS works in any atmospheric conditions, anyplace on the earth,24 hours every day. To utilize GPS there is no membership cost or setup required. To ascertain the position, GPS recipient is equipped for accepting signals from minimum satellites. Depending upon the sort of utilization, the GPS handsets can be a Data Loggers, Information Pullers or Data Pushers. This gadget gets the GPS information and sends the information at standard intervals to the server.

At that point, the server investigates the information. To get the flag in the receiving spot the GPS receiving wire is associated with the privilege jack and fixes the reception apparatuses. One space is assigned for SIM card it gets the signal from GSM towers to react to the clients. The positive and negative wire is associated with the 12V or 24V vehicle control framework. At that point to get the signals from the satellites the tracker gadget is turned on. Now the device can receive the latitude and longitude values of the location of the bus. At GPS receiver gives the location values at any time. Now the bus unit has the coordinates with a timestamp which is then compared with the past coordinates and if there is any contrast the coordinates are refreshed and sent to the server over GPRS web.

The area details are stored in the server ex: ID, longitude, scope, timestamp etc. To distinguish each bus unit among the various bus units SIM number is utilized for distinguishing proof. Each bus transport has its own

GPS gadget with interesting SIM card. The server is the most significant module in this framework. The server manages the entire data.

The server is the midway between bus and client application. These databases comprises of ongoing about bus transport it includes information about bus routes, arrival and departure time and bus location.

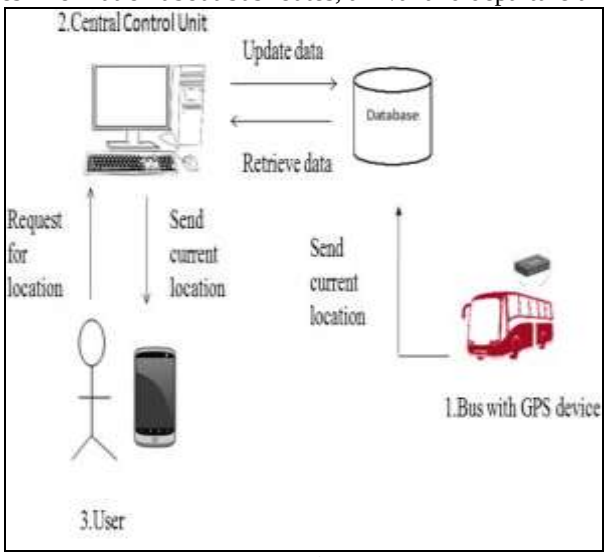

Fig.2 Architecture of proposed system

3.4.2 Server-Side Application (Central Control Unit)

The server application is only an administrator module whose undertaking is to transfer all static data about transport for example to include stops, add courses and so forth to the database. Server-side application stores all the information about the bus in database. Server application updates the information in database after specific time intervals. The client-application is totally rely on server-side application.

3.4.3 Client-Side Application

The client-side application is only an intelligent web-based application, which administrates the different capacity of framework to remote clients. The client-side module takes two inputs, for example, one is a source which demonstrates where the remote client is presently and second is a goal which demonstrates where he/she wish to go. At the point when the client sends a solicitation the application fires an inquiry to the server for getting to the data put away in the server database and gives the rundown of accessible transports as per remote clients source and goal. Presently it's clients assignment to choose or pick specific transport numbers to know the continuous area of transport or other information. After choosing a specific transport number, the application demonstrates the continuous area of that transport on Google map.

This application gives support and cooperates with different customers to give administration to client's demands. The framework encourages the constant following of transport.

4. CONCLUSION

Based on the proposed system the following conclusions are made. Our system tracks the real-time location of the bus using GPS tracker. By using this application passengers can reschedule their journey and can save their time. Our system saves the time of passengers by providing the bus timing information.

Our system can predict the arrival and departure time of the bus at the bus stop and can find reliable bus routes. By using the information school the bus can find the best routes and can reach on time. The proposed can help to reduce the bus bunching and unnecessary traffic congestion.

5. FUTURE WORK

There is huge room for improvement in the bus tracking system. This web application has a wide scope in the future. With the help of a highly sensitive vibration sensor, the accidents can be detected. The implementation of CCTV cameras and video recording features can make this system more advanced and secure.

This implementation will help to stop accidents and crimes.A web application can be converted into a cloud. This application can be useful for Security. By using motion sensors we can calculate the speed of the bus.

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