Smart Bus Station Passenger Information System with Vacant Seats

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Abstract- **The people who use inner city public transportation vehicles want to get information about the current status of the public transportation and they want to know the travelled time of the vehicles both while travelling and waiting at the bus stops. Passengers wait for long time at the bus terminus expecting the bus to arrive as per the scheduled. In this proposed system user will get the information about available buses for a particular route, current location of the bus. User will also get notification about the time at which bus will arrive to the next stop and they will also get information about the vacant seats available in the bus. It has a GPS system that tracks the position of a particular bus and the data is transmitted by an android application to the server. The important sections of the system are: Web server module, admin application, android application, hardware module. Through this developed system, moreover, It is ensured that the position and travel information of the vehicles through and android application which user and conductor both going to have, this will increase life qualities of the people who use the public transport vehicles and facilitate their urban life cycles.**

Keywords- **Android application, Microcontroller, Bluetooth Connectivity.**

I. INTRODUCTION

Public transportation buses are indisputable mode of transportation for passengers in developing and under developed nations. It is a very cost effective mode of transport. According to the World Bank report India's transportation sector is one of the largest in the world and caters to the need of more than 1.1 billion people. Indian roads carry almost 90% of the country's passenger traffic. One of the major challenges as mentioned in the report is that India's roads are congested and poor quality. For example, the delay in arrival time of a bus is a major issue at bus terminus for passengers travelling long distances. Due to reasons such as heavy traffic and roadwork etc., most of the buses are delayed in time. For best tracking result, GPS technology can be used. The GPS based system can provide all specifications that are necessary for tracking a vehicle.

Traffic congestion is a global, day-to-day problem that is plaguing Indian road transportation for long. The demand of vehicle approaches the capacity of road and extreme traffic congestion occurs. The troubles and difficulties experienced by the general public cannot be expressed in words. Unnecessary delay to work, school etc., delay in treating patients with live threatening situations, delay in attending interviews etc. are very few examples of people suffering caused by traffic congestion. One of the results of such traffic congestions are that all the public and private transportation buses will be stuck in the traffic and people will have to wait in the bus terminals for long, without any information about when the bus will reach.

The proposed system consists of Web server module, Admin application module, Android application module, Hardware module. The Admin application module will manage location, routes, and buses. It will schedule bus on routes, and also provide start time, source and destination. Through an android application module user will login, put source and destination for searching and send request to server. Server will search for currently available buses and send detail to client. When the bus reaches to the stop conductor will update. In this system by using sensors vacant seats count is calculated.

The correct location and arrival time is provided through an android application by tracking a vehicle using the GPS technology. People need not have to wait for long time at the bus terminals. Using the smart phone application anyone who want to used the public transportation system, can find the time of arrival of particular bus at the particular destination even at their homes and plan their departure from home accordingly.

II. IDENTIFY, RESEARCH AND COLLECT IDEA

Cell Of Origin (COO) technology, prediction algorithm based on dynamic adjustment of different bus route section. They have created database using the information of previous buses. The database is automatically updated by online data of average speed of bus route section .They have calculated the arrival time using prediction algorithm, COO technology. Comparing the data of stable traffic and the data of heavy traffic we can find out that the accuracy of the model is higher when the traffic is in the heavy state, because when the traffic is heavy there will be less data value change compared with previous bus [1].

They have achieved high speed data reception and transmission using Field Programmable Gate Array (FPGA).In this system to solve the problems of data collecting in intelligent substation operations aided analysing system, they have design a hardware device of network message parsing based on FPGA [2].

This method is based on combination of GPS, GSM/GPRS model. The client is provided with the information about the nearest buses' current location approaching the stop. The system will definitely control the accidents due to over speed by alerting the driver and passenger. Also people can access the information of nearest bus through SMS service by sending the bus stop id. This will help to reduce the long waiting hours for buses at the bus stops and detect the over speed of the buses there by reducing road accidents [3].

Proposed system in this paper will track the current position of bus and also the dynamic arrival, departure time as well as information of the passenger via display boards at the bus stops or through an application installed in smart phone [4]

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Algorithm:
        Step 1: Add all location L in database.
        Step 2: Li(x, y) is the current location stored in the database.
        Step 3: Let Lci(x, y) be the current location of users.
        Step 4: Find out the minimum distance comparing with database.
        Step 5: For i=0 to all location L
                [Compare with each location]
                 Current dist d= compare (Li(x,y),Lci(x,y))
                Add in vector Vi.
                End loop.
        Step 6: Find minimum distance from vector Vi.
        Step 7: Display Current location L.
                Compare (Li(x,y),Lci(x,y))
                $D=\sqrt{(x1-x2)^2 + (y1-y2)^2}$
                Return D.

III.   CONCLUSION

Now a days, peoples life have become so busy that they aware about the arrival of the bus and whether the vacant seats are available or not. The system which is developing will track the location of the bus and vacant seats which are available. Because of the vacant seats count the people already know whether they should wait for particular bus or else they should find another option. And this will going to save maximum amount of travelling time. For the implementation of vacant seats count we are going to use IR Sensors.

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