

A Survey on Transport System Using Internet of Things

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Abstract: The Internet of Things (IOT) is a system of related computing devices, animals or people that are given a distinct identifiers and the capability of transferring data across a network without human interaction. IOT has been highly equipped in transport system. In today's fast growing world people tend to wait for a long time in bus stops for buses to arrive due to increased traffic, accidents and bad roadways. To overcome such disadvantages, this paper deals with major challenges in the public transport system and discusses various approaches to intelligently manage it. Basically, the current position of the bus is located using GPRS and GPS but they would not able to handle high demand on the backend which will exist in the near future. The primary attribute of this paper is that we have used MQTT (Message Query Telemetry Transport) for the backend handling. MQTT will be light weight, data efficient and scalable. This system is implemented at the backend and the front end required for the tracking system and has exhibited the improvements. As large numbers of buses are tracked, the data generated will be huge, that will be stored in a Cloud server.

Keywords : GPRS, GPS, IOT, MQTT, Tracking System, Transport.

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I. Introduction

The way in which people move in their locality's public transport system is the main problem which plays an increasingly significant role. It is a lucrative mode of transport. Because of traffic block and other incidents most of the buses get delayed in time to arrive. At the bus stop people have to wait for a longer period of time without knowing the time of arrival of the bus. People who use the public transport cannot find time of arriving of a bus at the nearest bus stop from their homes so that they can leave from home appropriately. Because of the abrupt delays due to traffic blockage the time of arriving of the bus could not be assured. Our primary aim is to provide a tool to remote user which will bring down the time of waiting for bus and will equip the user with all required details concerning the time of departure or arrival of the bus and also its present position and anticipated time of waiting. So as to identify the present position of any bus and the approximate arrival time, an organized tracking system is required. In order to determine the tracking result accurately, GSM and GPS technology is used. To monitor a vehicle a tool with GSM and GPS technology will provide all specifications that are required. This system will be able to detect the present position of the bus and notify the central controller at the bus stop. As soon as this information is updated in the server, the passenger can access this data through a web application via internet from anywhere at any time. In addition to this, our system also provides a web application which is interfaced with IOT that will display all the transmitted data to the user along with the current location of the bus on the web application. The web application has an interior global timer which will refresh the tracking application for every forty seconds and will retrieve the latest location and other custom-built vehicle parameters and will update the user with the recent information of the bus. Influencing people to use public transport helps in reducing traffic congestion as well as the impact on environment. Our primary aim is to increase the utilization of public transportation and to satisfy the current public transport users and help in motivating more people to use public transport. If remote users wish to use public transport, it offers a trouble-free way to see which bus is closer to the user location and relative time the bus will take to reach the nearby stop, in real time, thus they will be able to decide to wait at the stop or not. This convenience is provided to the pedestrians by our proposed system. The real location of any bus is determined by using the Global Positioning System and then the data is transmitted. The transmission shall take place through terrestrial radio or cellular connection, satellite from the bus to a radio receiver, satellite or nearby cell tower. Once the information about the location along with other data is collected, a wireless communication system is used for transmission purpose.

II. Survey

[1] This Paper represents the recent growing technology named Internet of things. This technology deals with human to machine interaction and vice versa which enables to bridge the gap between human and machine capabilities. It mainly focuses on the protocols and applications used in IOT that allows researchers and developers to estimate how these protocols fit in to satisfy the desired functionalities. It also compares the efficiency of IOT with other latest technologies like Bigdata, Cloud computing, fog computing etc. IOT overcomes various data handling, efficiency and performance issues that were faced by earlier technologies like GPS and GPRS.

[2] Presently the vehicular movement is influenced by abnormal activities such as traffic block, unpredictable delays and inconsistent vehicle dispatching times. This causes an inconvenience to the passengers having to wait for a longer time in the bus stops for the buses to arrive as they do not have real time information about the buses. Researchers are making efforts in developing control strategies to support the features of bus transport systems. This paper emphasizes on the execution of a Real Time bus Tracking (RTBT) system is achieved by installing GPS devices on city buses that will impart the location where the bus is currently present to the GPS receiver. Then the GPS Receiver shall be interfaced with the computer and the interface driver would save the data automatically in the dot text (.txt) format file which will be continuing till the GPS module works. Hereafter, this application will be retrieving data and storing it in web server from which the real time information of the bus will be displayed

[3] The real time query system for public transport system with ZigBee and RFID is suitable for passengers demand and provides information regarding bus location, bus numbers and the total number of persons inside the bus at any time. This system provides efficient and also low cost public transport system.

[4] The Real Time Bus Monitoring and Passenger Information tracker would serve as a feasible notification system that will productively help travellers in deciding whether to wait for the bus or not. This tool is a standalone system devised to show the present position of the buses in the Mumbai city. The system will contain a transmitter module that will be installed on the buses, receiving boards installed at the bus stops, map embedded with LED on the best bus routes at the centralized controller. It will also maintain passenger information system software present at the bus stops that would issue the user with the related data concerning all the bus numbers going from his current location to his destination along with the details of the route and the cost. Congregating these modules will allow the tracking device to acquire GPS information, which will then be transmitted to the centralized control unit and prompt it by actuating LEDs in the estimated geographical positions of every bus on the route map. It also disseminates the bus numbers and routes regularly as soon as the bus arrives inside the range of the user at the bus stop. In addition, the device will be sustainable and portable. It will not require an exterior power source that might avoid high cost of energy.

[5] The system provides the present position of the user desired bus and calculated time of arrival at distinct stops in their corresponding routes. The present position of the bus and the ongoing route of the bus is located by the link updater. The approximate time of arrival is updated at control unit and this information is shared to travellers using display boards at bus stop.

[6] This Paper aims to reduce the time of waiting of the passengers by detecting the location of the buses by using Global Positioning System (GPS) and sending those details to the users via SMS. Also, web application based on Global Navigation Satellite System (GNSS) have been developed to show the position of the buses on Google Maps with high speed.

[7] Unlike the previously available bus tracking systems, this paper aims to leverage the transport system to the next level of development. Today's Transport Schedule already has an accurate and well defined arrival time for all the routes in and around the city which indeed can be enhanced by providing the information regarding the available seats in those buses. This Paper handles this task of informing the people about the total number of available seats in the upcoming buses by building an application that is accessible to the commuters via economical wireless system. These methods offers incremental development for the public transport system to detect the number of seats required in various cities based upon their population growth. It helps in making the people prefer public transport than the private transport which avoids lot of traffic, accidents, pollution and also to have reliable, flexible, comfortable and convenient usage of buses by the people.

[8] This System uses GPS and GPRS to locate the buses and to send the tracked details to the people. These Real time passenger monitoring technologies helps to determine the total number of vacant seats along with the location of these buses across various areas and bus stops. This helps in making people be prepared always to face any kind of circumstances when they move out of their house.

[9] A GSM query response system is used to track the real time transport information. This enables the system to track large number of buses at the same time, detect the route it takes and to predict the time of arrival with a greater accuracy. The microcontroller collects data from the GPS module and carries it to the control point using the GSM module.

[10] This paper presents a smart bus tracking system that is based on GPS, GSM, QR coding and Google's map. The proposed system calculates the arrival times of the bus at every stopping by keeping track of every bus and sends notification to the users via electronic mails and Short Message Services. The system helps passengers by avoiding unnecessary waiting at bus stations and allows them to use their time efficiently.

III. Conclusion

This system helps to predict the arrival time, time to reach destination and the people count in every bus. With the help of GPS tracking, Ultrasonic waves to find the distance between people and the buses and also between different buses. Suppose the bus is very crowded then this will allow the people to know the arrival time of next bus and take decisions whether to wait or not. A Real Time Clock (RTC) is used to determine the current time and a PIC microcontroller to program with RTC. This system would obtain the present position of the bus and notify the central controller situated at the bus terminus. As soon as this information is updated in the server the user can obtain the information with the help of web application using internet from any location like their residence or work area. The transmission can be terrestrial, radio or cellular connection, satellite from the bus to a radio receiver, satellite or nearby cell tower. The primary aim is to make the public transport system convenient to use for the pedestrians.

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