

Real Time Bus Tracking and Arrival Time Prediction for Smart City

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Abstract

Today's situation of using public transport means investing a lot of time due to delay of buses because of many reasons. People do not much rely on public transport instead opt for private vehicles which in turn increases pollution and traffic.

To overcome the above issues this project is being proposed. Since this is a real time project, we are providing dynamic time table which will broadcast the actual time taken by the buses. The main feature of this project is the desktop panel provided in the bus which will provide the passengers information like current location, arrival time of next location, distance to the next stop.

Hence the main motto of this project is to encourage people to rely more on the public transport.

Keywords-cloud computing, android studio, smart paper.

I. INTRODUCTION

Many people are using their personal vehicles instead of public transport because they are not providing better services (comfort, convenience, Time table, manual data entry and so on). EFFICIENT and easy-to-use the admin is a person who is going to administer all the activities like observing the bus locations, finding the breakdown, etc. His/her is the only authorized person that can have access to the data and can manipulate it (add, delete and upgrade). Admin is very essential as everything is done under his observation, no action can be taken without his or her permission. We are providing desktop in the bus for display information regarding the locations. For new people in city it will help to explore the places of interest. For marketing purpose and building capital for system. Buses don't follow the timetable because of that People have to face the problem for getting the exact time for bus. Crowd is the main problem so that people can't get the seats. Driver can have the updating of the route of bus by using navigation.

II. BRIEF DESCRIPTION

Today's situation of using public transport means investing a lot of time due to the delay of buses. people do not much rely on public transports instead opt for private vehicles, which in turn increases pollution and traffic. new common citizens cannot rely on buses which decreases the use of public transport. due to more and more use of private vehicles the issue of global warming is also increasing. application for user, which can suggest them nearest bus stop and buses arriving on their bus stop, passenger information panel inside bus. web based admin panel for admin to monitor all buses. in this application to identify nearest bus stop, to identify real-time bus arrival on bus stops, to know the location of all buses, to provide users online ticket booking. bus users must see poi and location time based.

III. RELATED WORK

A. Arbiter

The admin is a person who is going to administer all the activities like observing the bus locations, finding the breakdown, etc. He/She is the only authorized person that can have access to the data and can manipulate it (add, delete and upgrade). Admin is very essential as everything is done under his observation, no action can be taken without his or her permission. Since this system is very huge as it is for the entire city and multiple functions are to be carried out simultaneously. Also, the work flow should be in disciplined manner and should go without any interruption. For the security purpose of the system, only a particular person should be given access to the system. For this we are providing Admin as the authorized person. Only the admin can access and observe the work flow of the system. The admin has to take proper action if any failure occurs. Web Based admin panel for admin to monitor all buses. Whole system depends on the handling functions by authorized person. The main objective of the admin is security of the data. The admin has to continuously watch the system for the smooth working. Admin has the authority to adding and up gradation of the content. Only one person can have the authority for the system. Without admin our system has no disciplined function. Multiple functions are organized in our system. Monitoring on these functions is very important task such as defining routes, bus breakdown etc. For the security purpose the authority must be assigned in system. Web API: API methods are used for both the android applications, in web API, the exact arrival of bus is calculated using distance algorithm, traffic conditions are calculated from Google API, all above calculations can be done when the driver updates their current locations. Web Application: Application can be made for admin user with following features: - ddefining bus stops, ddefining routes, receiving notifications of breakdown, ddefining places of interest, adding advertisements. Hence the authorized system improves the functionality and services to the users. In short, the administrator is the dictator of the system.

Architecture

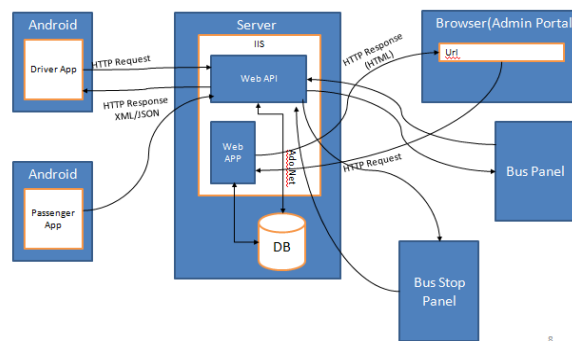


Fig 2.

B. User Application

Login, Registration. Destination can enter by user and search Destination. They can find nearest bus stop. List of destinations, buses in the arrival of first. Online booking Number of seats. Payment option. Validity of the online booked ticket will only be for a Particular time span. Refunding.

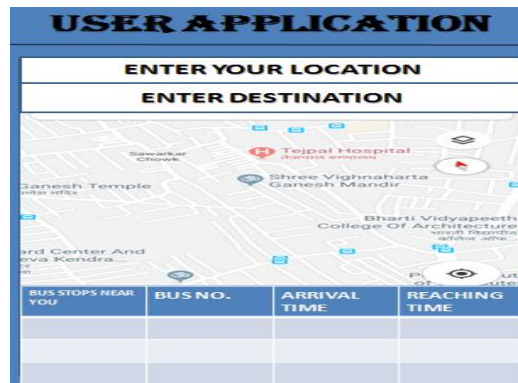


Fig 3.

C. Driver Application

International Mobile Equipment Identity (IMEI). Password,

Login restricted to single phone. This application is mainly design for user because of timing problem, missing the destination etc problems. If suddenly the bus breakdown happens then it will problematic to handle the break down and replacement of that bus. People need to get the seats in Bus because of crowd people don't get the available seats. User can reserve the seats by getting the updating of available seats. User can see the current location of bus by using GPS.

User can save the time and timetable of bus will be followed.

The user can see the next available buses. Nearest bus stop suggestion and Real-time bus arrival schedule to user. The main objective of user application is to simplify the work of user by reserving and observing the locations. User can save the time by using the user application. Driver has the authority to update the location by using his mobile. So, we can save the time by getting current location of place. By this system driver can handle the breakdown of bus by providing the current location.



Fig 4.

D. Panels

In Bus Panel: Algorithm to be used: -Haversine for Distance Calculation, Bearing Calculation- to detect bus direction of travelling, K-Means for Location clustering. Hence by providing all the information on the panel will help people to reach their destination on time. For marketing purpose this will help to raise the capital for system. People will be motivated to use and rely on the public transport.

In cheap cost we are trying to provide better services.

STOP ARRIVAL TIME AND DESTINATION TIME		TOURIST PLACES NEARBY
NEXT STOPS	ESTIMATED TIME	1.
		2.
		3.
		4.
		5.
ADVERTISEMENTS		

Fig 5.

Bus Stop Panel: Every bus stop will contain a LED panel. This panel will contain three sections as:

- Timetable
- Destination
- Advertisement

All this information would be provided on the panel at the bus stop. The panel should be on every bus stop of every area. The bus stop panel will provide information about the buses coming and their destination and even the advertisements.

To inform the public at bus stops about the busses coming to this stop by real time prediction technique. It will also mention the destination of all these coming busses. The panel will display the advertisements of the nearby shops and the tourist places as well.

BUS TIMINGS				ADVERTISEMENTS
Bus Number	Destination	Arrival Time	Destination reaching time	1.
				2.
				3.
				4.

Fig .6

IV.USE CASE DIAGRAM

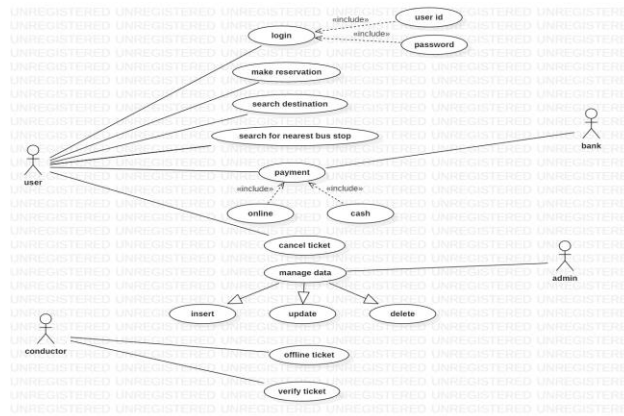


FIG 7.

V. CONCLUSIONS

Bus monitoring system can help transportation authority’s efficiently monitor all the buses and improve the operational efficiency of the entire transportation system and the system can save lot of time and money. Hence admin system improves the functionality and services to the users, in short the administrator is the dictator of the system. buses providing all the information on the panel will help people to reach their destination on time. for marketing purpose this will help to raise the and the capital for system. people will be motivated to use and rely on the public transport. in cheap cost we are trying to provide better services. the people are informed about the actual time of the bus arrival and their destinations. the shops nearby or the restaurants etc can reach to local people by the advertisements provided on the panels. the public may even know about the famous tourist places around the areas they are traveling through.

VI. ACKNOWLEDGMENT

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REFERENCES

[1] Pengfei Zhou, Yuanqing Zheng and Mo Li, “How Long to Wait? Predicting Bus Arrival Time with Mobile Phone Based Participatory Sensing”, IEEE, June 2014

[2] Rinorobina, Thamaraimuthamani, “Predicting Bus Arrival Time with Mobile Phone Based Participatory Sensing”, IJAICE, April 2015.

[3] Sudhakar K N1, Rashmi K2,” Predicting the Bus Arrival Time Using GPS and GSM Technology”, IJSR, May 2015.

[4] H. Gao, J. L. Li, F. Yang. Bus Arrival Time Prediction Based on Probe Bus Fleet. In 2nd International Conference on Transportation Information and Safety (ICTIS), pages 773-779, 2013.

[5] J. Patnaik, S. Chien, A. Bladikas. Estimation of bus arrival times using APC data. Journal of Public Transportation, Vol. 7, 2004.

- [6] L. Vanajakshi, S. C. Subramanian, R. Sivanandan. Travel time prediction under heterogeneous traffic conditions using global positioning system data from buses. *IET intelligent transport systems*, 3(1): 1-9, 2009.
- [7] S. Ishak, H. Al-Deek. Performance evaluation of short-term time-series traffic prediction model. *Journal of Transportation Engineering*, 128(6): 490-498, 2002.
- [8] S. I. J. Chien, Y. Ding, C. Wei. Dynamic bus arrival time prediction with artificial neural networks. *Journal of Transportation Engineering*, 128(5): 429-438, 2002.
- [9] B. Yu, Z. Yang, B. Yao. Bus arrival time prediction using support vector machines. *Journal of Intelligent Transportation Systems*, 10(4): 151-158, 2006.
- [10] Sinn, Mathieu, et al. predicting arrival times of buses using real-time GPS measurements. In *15th International IEEE Conference on Intelligent Transportation Systems*, 20ss12.