

System for Estimation of Traffic Conditions and Providing Alternative Routes

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Abstract— People spend most of their travel time in traffic jams. What if they get to know about traffic conditions of the route by which they are planning to travel? Using this information people can choose path from alternative routes available which will save the time as well as the energy.

A client server application can be used to solve the problem mentioned above. This application gathers information from users only to provide the service. Client side consists of the android application running on the smartphone. This application gets the information of current location, destination using the location based services available. In application GPS is used to get this information. App do the calculations of traffic conditions based on the data obtained when the user is travelling. This data is then sent to server which stores information into database and provide it to the new users when they request for the route with similar co-ordinates. Web services are used for this. Suggested routes are then displayed on the requesting client's application using the map. Alternative routes available for the requested destination are shown using the different colors depending on the route efficiency. The route efficiency depends on the speed of users travelling on that route.

User gets the better route and saves the time by travelling by the path obtained. This application is useful to all people in daily life and it can be very useful in emergency services like fire brigade, ambulance etc. where time is a critical factor.

Keywords— *Location Based Service, GPS (Global Positioning System), Web Services, Android Application, Web Application, Traffic Monitoring*

I. INTRODUCTION

Smartphones are important part of daily life of people now. Those provide technology which helps to make human life simpler, easier, and faster. So the smartphones are used to provide service for saving the time by use of application of getting better routes to travel. These LBS services open a wide area of facilities as reporting any incidents like fire or accidents to the nearby help center. Also it helps to find nearby facilities as hospitals, theaters, malls etc.

The location based services are used in the system. The LBS gives the geographical location of devices executing

application and provide the services based on the information of location. LBS gives the real time location. So it can be used to get the real time traffic on the routes and avoid the jams.

This system is community driven only. No need of any third party dependency other than system managing people and the users. The system administrator, manager are to manage the working of system while the useful information is gathered from user's side only which is going to be useful for the route selection of users willing to go for the same destination. The traffic updates are obtained from the client application and the traffic conditions are then saved to database along with the timestamp. When requested for the same segment area, the route's conditions are checked in database using timestamp information to get real time traffic and routes get displayed on smartphone maps accordingly. This is implemented using the web services which created using servlets to provide service which is explained above.

II. RELATED WORK

In the systems which are working on the similar concept of traffic detection and management, different approaches are used as sensors, GPS, social networking etc. In the method of using sensor, the sensor is mounted simply on the signal poles or placed alongside the roads where they sense the vehicles passing by the mounted sensors. The data collected by system using these sensors is then utilized to provide users information about the traffic conditions and suggesting routes to manage the traffic.

Use of social networking is the new emerging field. As the number of people using social networking sites are increasing day by day, this method can become a successful way to provide traffic updates to them. A special framework called social life networks is being designed to use the social networking in data analysis work. Users are the active members of system. Users always post about the events occurring in their daily life. Similarly they will post about the traffic conditions of roads. Using the timestamps along with this big data collected and the framework to analyze this large amount of data, better routes are suggested to the users.

Now days GPS is used mostly in the applications that work on location based services. GPS technology is easily available on the mobiles. This technology used along with mobile network in smart phones gives better accuracy than other methods. It gives location in few seconds and has better coverage.

III. PROPOSED SYSTEM

Proposed system consists of the client server architecture. The client side consists of the android application running on the user side when they want to travel. Server side is implemented in JAVA providing services to user which are created using servlets. MySQL is used as database to store the information.

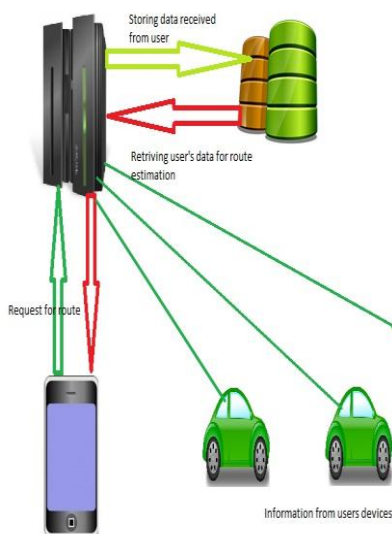


Fig. 1. System Architecture

Traffic conditions are obtained from the user side only. The android application gets the data from user as the start point and destination from the users. Application uses the GPS facility of the smartphone. This GPS is used to get the location of user. Thus the locations are obtained while user is travelling time to time. The locations are associated with the timestamps at which they are obtained. From the two location points distance travelled can be computed and the difference between the corresponding timestamp gives the time taken by user to travel between those two points. From this distance and time information speed is computed as –

$$\text{Speed} = \text{Distance}/\text{Time}.$$

Thus the speed of travelling is obtained for small segments within the entire route using method mentioned above in timely manner. In this way even the faster segments of road are obtained to save the time. These location points, their timestamps and corresponding speed information of speed is transmitted to the server side. Server controls the connectivity to the database. MySQL database is used in the system. Traffic information obtained from user's side is stored into database. When any new user requests for the route between the same start and end point, server checks for traffic information in

database. According to the traffic conditions the routes are suggested to user using maps on client application. Routes with different speed are shown with different colors on the map.

User can use the system for accident reporting also. Using the APIs and GPS service nearby facilities as hospitals can be searched easily. When user reports any accident using the application, the message containing captured location is forwarded to the nearby hospital so that the help will be able to reach at the accident location as soon as possible.

IV. IMPLEMENTATION RESULT

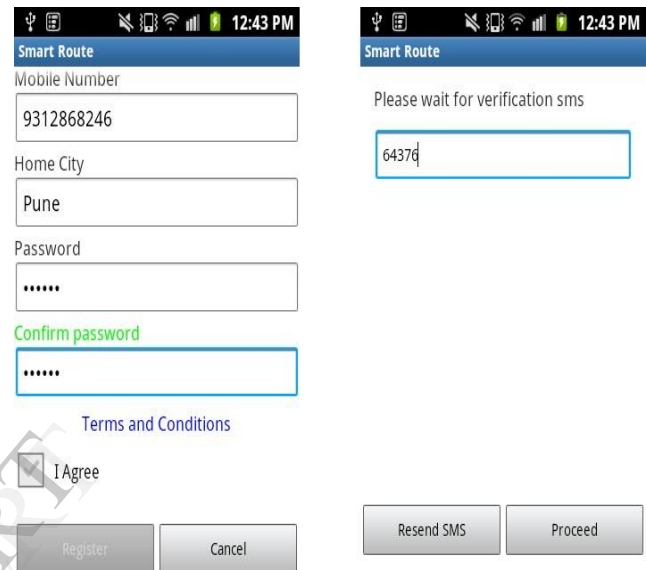


Fig. 2. Registration and Account Verification

Users are able to register application SMART ROUTE to mobile using the verification code which is sent to them on the mobile number specified by them. As user logs in the application, his location is captured by system and shown by map. Options like searching location, requesting direction, reporting traffic manually, changing map type and getting locations of friends are provided to users. According to the option selection of user results are displayed using maps on the smart phone display.

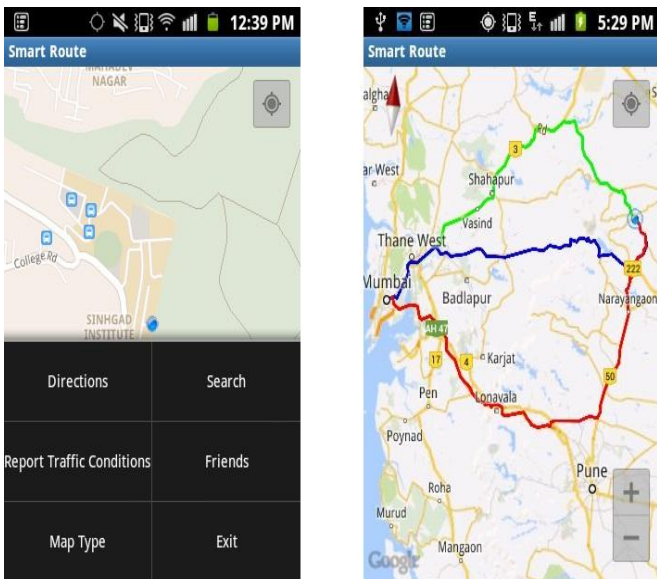


Fig. 3. Option Selection and Route Displayed Using Map

V. FUTURE SCOPE

Primary intention of the application is to provide better routes to user for travels. But with this general usage this system can become useful to many other applications. This app can be used for the traffic management purpose. According to the data collected about traffic computations, the traffic managers or traffic police can avoid the conditions of traffic jams. Application can be used in the signal systems for adjusting time of signal. As the signals are controlled according to traffic, vehicles will not have to waste time at signals when traffic is low.

Another field where this system is useful is public safety or emergency service. For this service now call center method is in use. For example police and fire brigade services are provided using numbers 100 and 102. These calls are received at agencies and then forwarded to the respective departments. This process takes place manually. Application with LBS can

be used for this reporting purpose. As this app brings automation of work in process and request of help get forwarded to nearest hospital or other help centers, few minutes of time is saved in getting help which matters in these cases of emergencies. Problem of busy line will be reduced by use of this technology.

VI. CONCLUSION

Web Services are used in rendering information for the mobile application as well as to provide advance functionalities. In the smart route prototype of mobile application the web services are used to get the information from users and provide them better routes or accident reporting service. In this paper, we have proposed use of location based services and architecture of application to implement those service.

ACKNOWLEDGMENT

This research was supported by Smt. Kashibai Navale College of Engineering, Sinhgad Technical Education Society, University of Pune. We also like to express regards towards Prof. Nalini Mhetre, Computer department of SKNCOE and Mr. Siddhesh Bhobe from Persistent Systems Pune for their continuous support and guidance.

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