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To analyse real-time traffic conditions with the help of GPS

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Abstract: Today, Indian Metropolitan cities are facing big problem of traffic congestion. Current infrastructure cannot be expanded more. Current traffic looks to optimize travel times, but fall short on the ideal traffic system. Some users daily go from one location to another location. By use of GPS technology, we can record their time of travel. If day is Monday and if morning, user may need 45 minutes for travel. If day is Sunday and at afternoon, same user may need 10 minutes for travel. Thus, depending upon date, time, weather, holidays, time required is different. So by acquiring this large data, by applying intelligent algorithms on them, we can figure out time that may be required by any user to go from one location to another location. By this we are using historical data in prediction of current time.

To solve this issue proposed system works on real-time data from different users, to get the actual image of current traffic status. This will be available to all travellers so that they can choose the paths which are less crowded. This will ultimately lead to better traffic management. The time wasted in high traffic zones will be reduced. To solve this issue proposed system works on real-time data from different users, to get the actual image of current traffic status. This will be available to all travellers so that they can choose the paths which are less crowded. This will ultimately lead to better traffic management. The time wasted in high traffic zones will be reduced.

Keywords: Database Management, Information Search and Retrieval, Social Issues, Real-time Analysis

I. INTRODUCTION

The smart traffic suggestive app should assist people to get accurate picture of traffic conditions and also should predict time perfectly for their journey from one point to another by real time analysing different conditions like current traffic speed on road, weather, road conditions, distance, etc. by use of GPS system. Generally during peak hours, there are huge number of vehicles running on the road and we find very high density of vehicles at road junctions. Generally during office or school timings people are in hurry to reach their workplaces on time and if they have to wait for long time on roads, they start doing illegal moves like breaking signals, breaking traffic rules etc. and thus traffic situations become more and more worse. So by use of GPS technology, smart phones, we can try to tell end user how much exact time will be required to go from your location to destination. Also traffic congestion has a bad impact on economy, time, the environment and the overall quality of life. Hence it is high time to effectively manage the traffic congestion problem.

II. LITERATURE SURVEY

• Real-time Traffic Flow Forecasting Using Spectral Analysis
– Author: Tigran T. Tchrakian
– 1524-9050 IEEE 2011
– Short-term prediction of traffic with real time updating. – It uses historical data.
– Modal functions for prediction are associated with the covariance data matrix based on historical data

• Real Time Detection of Traffic from Twitter from Twitter Stream Analysis
– Author: Eleonora D'Andrea
– 1542-9050 IEEE 2015
– Use of Twitter tweets as database.
– By applying Data Mining Algorithm on those messages (Support Vector Machine)
– Text Analysis and pattern classification shows best results in traffic analysis

• Real Time Traffic Analysis At Night Time
– Author: Jose M Mossie – IEEE 2011
– Use of video-based approach in traffic analysis in night light conditions
– Knowledge of Headlights can be used to find intensity of traffic, mean speed, Occurrence

III. SYSTEM ARCHITECTURE

1) DATA GATHERING: This application will run in background with the permission of user. It will periodically fetch the GPS locations. From two successive GPS locations it will calculate the distance travelled and the time difference between these two GPS locations is calculated. From the distance and time, the current speed of that vehicle is

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calculated. This speed is then temporarily stored in application cache and uploaded to server with following format:

[CURRENT SPEED||CURRENT LOCATION||CURRENT TIME]

This data is then sent to remote server via internet in JSON format. If current speed is same as previous speed, it will not send that speed immediately. When there is a change in speed, it will update that to the server. This procedure is repeated periodically.

2) USER REQUESTS HANDLING USING ANDROID APP: When user want to get traffic details, he/she will open the app and enter source and destination locations on the map. Once the locations are confirmed, application will calculate the available routes which connects those two coordinates on map. With the help of Google's Roads API, exact routes can be determined. Application will request for latest traffic data on those particular areas. From that data, the routes are assigned with MAX SPEED, with which vehicles are travelling. It will show each route with time required to reach destination. From all routes, the route which is fastest, is given priority in results. Now user will select any route that he/she wants to follow.

3) DATABASE: Database will store all the latest updates about traffic speeds in particular areas.

Fields in database:

[Area||Roads||Speed||Updated On]

Area : this will represent a particular area on map. e.g. Kothrud, Erandwane etc.

Road : this will represent a particular road in that area.

Speed : this is the current speed at which the vehicle is travelling.

Updated on : this is the time at which this record is obtained.

There will be a module which will update the database based on users traffic information. This module will take multiple inputs for same location for some threshold time, and then will aggregate them to get more accurate speed of traffic at that location. After aggregating, it will update the database. Due to this intermediate module, application will not directly have access to database, and multiple update operations will be reduced to single update operation making database more available for other uses. At the time of requests, application will request this module for particular area's current traffic information. This module will then query the database to get the current traffic speed at those roads. This data then will be sent back to application via that module. This module will also have some cache to store most accessed location data, so that it can send those immediately without querying database again and again.

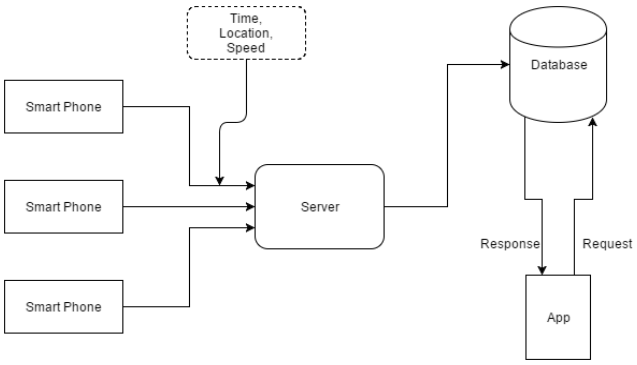

Fig. 1.System Architecture

IV. CONCLUSION

Today, our roads are getting immensely populated by vehicles. We are investing huge amount of resources to create new infrastructure to handle such mass number of vehicles, e.g. building new flyovers, tunnels, underground roads or new highways, this is been traditional mantra. But there is a better way to manage such huge traffic, using help of technology, instead of just dependent on infrastructure development. The proposed system deals with Smart Traffic Management using data mining which will try to reduce the issues of existing working systems. The proposed idea look towards fine management of traffic congestion in upcoming or existing smart cities. We will build up database of more dense data about traffic, we would get pretty nice picture of flow of traffic around city. We can route traffic via different roads to avoid congestions, using predictions made through such data, Smart app can assist people to get clear picture of current traffic. Current technology is good, but this app will give refined result. This provides runtime important traffic data which would help in reducing the travel time for the users. Time to reach particular destination gets hampered by national holidays, holidays like diwali, dasara and so many, big pilgrimage and festivals, and other daily traffic. Aggregating all this data we can tell user estimated time for travel.

V. ACKNOWLEDGEMENT

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