

Real time tracking of public transport system

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Abstract - In this paper, we propose a new public transportation system based on availability of vehicles at certain geographical areas. The proposed application manages a fleet of vehicles to accommodate transportation requests, offering point-to-point services with ride sharing. We are focusing on specific geographical area for greater accuracy. The former provides the vehicles to satisfy the admissible requests at restricted areas while the latter is to determine the set of all available public transport system among all requests to produce maximum choices. The proposed app uses location based services for real time tracking of vehicles with various additional features and addresses security issues. By utilizing the analytical properties of the problem, we develop an effective recommendation-algorithm-based method to tackle large number of transportation requests based on availability and registered users' interests. We validate the performance of the algorithm with real-world transportation service data.

Key Words: geo-tracking, Mobile Computing, location based services.

1. INTRODUCTION

With increased development in mobile computing & greater accuracy of the mobile devices, the mobile smart phones can easily determine the current location by which many useful things can be performed that holds most important role in our daily life. By using the devices' gps transceivers a location based service can determine the mobile devices location. Location based services provide user with useful information such as real time tracking of public transport systems, nearest hospitals, petrol pumps, restaurants, emergency services, police stations, banks or ATMs, or tourist spots or push-based notifications such as job alerts or events in that particular geographical area or other information to users who are new in a specific geographical range/area such as timetables of buses or trains or nearby autorikshaw or taxi stands. This app aims primarily real time tracking of public transport systems based on location based services and navigation to guide new people around. In order to minimize the waiting process in public transport system, there should be a means of communication or real time tracking of autonomous vehicles. Passengers have to wait unknowingly for auto/taxi, or other transport systems. This becomes even worse especially when peoples are new to particular geographical area. There is no such

guide to particular geographical area by every means. We are developing an android application by which user can locate required services on Google map to overcome such issues. Also user can find events in that particular area such as job alerts, social events on his/her interest basis.

2. NEED OF SYSTEM

To make navigation & real time tracking easy for native as well as non-native passengers. A system that synchronize the passengers as well as the drivers in real time was needed. Specialized services for native as well as non native users emergency services like hospitals in vicinity, police station etc. were not yet implemented for a restricted geographical area. Everything was generalised that doesn't provide very high accuracy. There is no specialized app for Getting Information on hangout places, picnic spots, tourism, and hotels; Getting co-passengers for sharing vehicle which will be beneficial in two terms. It will reduce traffic and fuel consumption & it will reduce the fare of passengers.

3. PROPOSED SYSTEM

3.1 Location-Based Service

Location-based services (LBS) provide the mobile users personalized services according to their current location. LBS use mobile smart phones gps, cellular network service operators, and internet service providers to develop and provide value-added services with increased accuracy. Location-based services offer many advantages to the mobile users. Location-based services (LBS) use real time geographical data from a mobile device or smart phone to provide information, entertainment or security. Some services allow consumers to "check in" at restaurants, coffee shops, stores, concerts, and other places or events. Often, businesses offer a reward — prizes, coupons or discounts — to people who check in. Google Maps, Foursquare, GetGlue, Yelp and Facebook Places are among the more popular services. There are various indoor and outdoor location APIs available for use.

3.2 Uses of LBS

- **Store locators** Using location-based intelligence, retail customers or users can quickly find the nearest store location or transport systems or other required things.

- **Proximity-based marketing.** Local companies can push ads only to individuals within the same geographic location. Location-based mobile marketing delivers ads to potential customers within that city who might actually act on the information.
- **Travel information.** An LBS can deliver real-time information, such as traffic updates or weather reports, to the smartphone so the user can plan accordingly.
- **Roadside assistance.** In the event of a blown tire or accident, many roadside assistance companies provide an app that allows them to track your exact location without the need for giving directions.
- **Mobile workforce management.** For logistics-dependent companies that employ individuals out in the field or at multiple locations, an LBS allows employees to check in at a location using their mobile device.
- **Fraud prevention.** An LBS creates another level of security by matching a customer's location through the smart phone to a credit card transaction. Tying the smart phone's location to a credit card allows you to flag transactions made across several geographic locations over a short time.

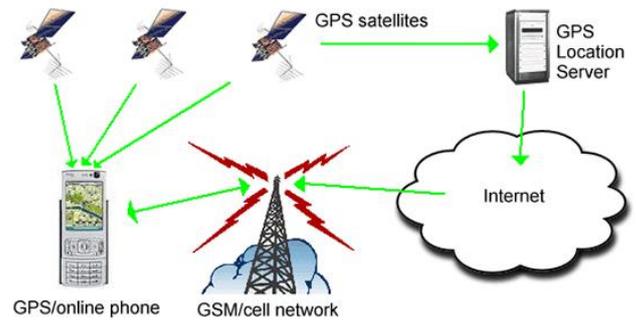


Fig -2: Working of GPS

3.4 Firebase

Firebase is a scalable, real-time backend for an android application. It allows developers to build rich, collaborative applications without the hassle of managing servers or writing server side code. It provides powerful APIs to store and sync data in real-time. It is a combination of data store and tools to get real-time updates for changes. Firebase is a cloud services provider and backend as a service company based in San Francisco, California.

3.5 System Architecture

Location - When GPS is enable current location of user is taken as an input to the application.

```
String bestProvider = locationManager.getBestProvider(criteria, true);
Location location = locationManager.getLastKnownLocation(bestProvider);
double latitude = location.getLatitude();
double longitude = location.getLongitude();
```

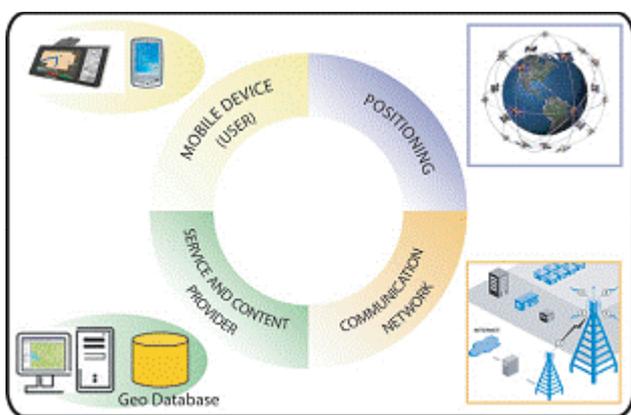


Fig -1: Location Based Service

3.3 Global Positioning System (GPS)

The Global Positioning System (GPS) a.k.a Global Navigation Satellite System (GLONASS) makes use of latitude and longitude and usually elevation to find the current location. GPS provides users with positioning, navigation, and timing services.

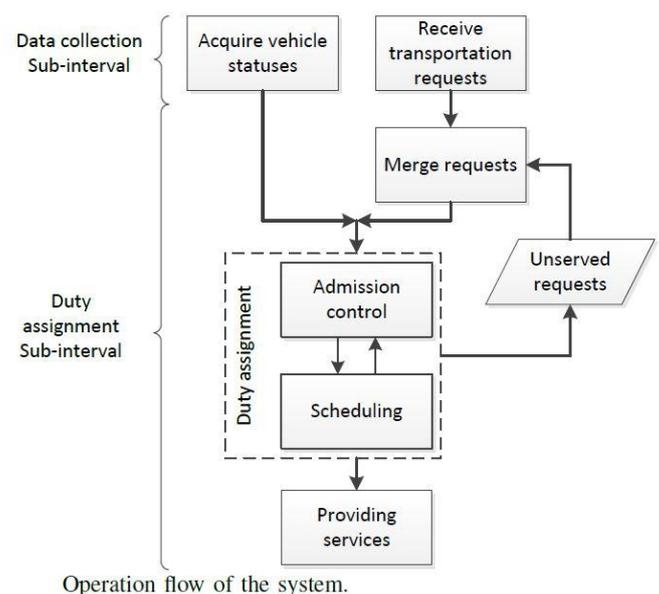


Fig -3: System Architecture

Using GPS current location of user is taken and stored on firebase. Similarly location of vehicle (auto/taxi) is taken and stored on firebase. On users device location of vehicle is fetched continuously and real time tracing is done. In these way user can come to know about the transportation facility even at mid night. Vehicle drivers can trace and leave for the route on basis of customers on that route. So that they don't have to wait on auto/taxi stand for customers.

User can book vehicle on their route. Also system allow to provide details of vehicle driver to family or friends of the user, so that in case of emergency user will get immediate help from family and nearby police using SOS button.

4. CONCLUSION

Input of the system is current location of user (Latitude and longitude) which can be taken if GPS is enabled. To find the nearest autonomous vehicle to the user by comparing two geo-points stored in an array of nearby autonomous vehicles, after the auto/taxi stands are listed the choice of user is taken based on the availability. This process of finding nearby transport systems is repeated until all transport systems within the specified range and displayed on map are covered.

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