RESEARCH ARTICLE

Traveler Guide using GPS

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Abstract—In this paper, an Android based mobile application is presented to guide the tourists and daily commuters in their travel in Mumbai city. Tourist guiding through mobile application informs the tourist about nearby Bus Stop. All details of buses arriving and departing at that bus stop. The application is designed for Mumbai city where the bus (BEST) services are provided to the people for travelling different places in Mumbai.
The Application gets the Current location of the user through GPS in the form of Longitude and Latitude and this information is send to the Sever. The server replies with the information which contains the nearby Bus Stand along with the Bus Details such as Bus no, Bus route, and Bus Source and Destination.
Index Terms—Global Positioning System (GPS), Travel Guide, Android Application.

I. INTRODUCTION

With the recent and fast developments in technology, smart phones offer many advanced services rather than making calls, so the number of smart phone users increases day by day, not only in urban areas but also in rural areas.

One of the areas that users can benefit from smart phone applications is tourism& travelling. Many tourists visit a region or city in limited time which may not be enough to visit every place. There are number of mobile applications has been developed for major cities of India. But for country like India where 70% peoples live in villages and Public transport buses are the main mean of transportation. There is no such application which would provide the bus details. If newcomer comes to city who is unaware of public bus facilities of that area gets cheated or looted by private transporters.

An application that can provide information of Buses to guide the tourists in their trip to such city because of constraints on scope of the project, we are developing the application for Mumbai city for helping the tourist and daily commuters to find the details of bus stop to travel different places in Mumbai.
Proposed Application uses the GPS & Google map to fetch the current location of the user and based on that the result is displayed to the user. The result contains the information of the nearby bus stop and the details about the buses such as Bus no, Bus route, Bus Source and Destination.

II. RELATED WORK

While deciding the features of a novel tourist guide application, we investigated similar applications.

A. M-Indicator

This mobile application provides local train timings, Best bus information, auto & taxi fares information to travelers. Drawback of this system is that user has to give his location or source & destination to application.

B. Bangalore city guide

There are lots of apps that give bus routes, but this application also gives time of buses. It has routes and timings for most of

BMTC buses (Karnataka, India). Drawback of this system is that user has to give his location or source & destination to application.

C.Hyderabad city guide

This application find out bus information by bus number, route information for particular bus, show the places near by the bus stop on the maps.

III. PROPOSED SYSTEM

Our Traveler guide system is composed of four components, a GPS Tracking Device, a server and a database, (Google Cloud Messaging) GCM as shown in Figure 1. The GPS tracking is done by GPS enabled android mobile that transmits location information to the server through GPRS & GCM networks. The server is a personal computer that receives the information and put it in the database. The database formats the information in a special form that can search and display using Google Earth software or Google Map.
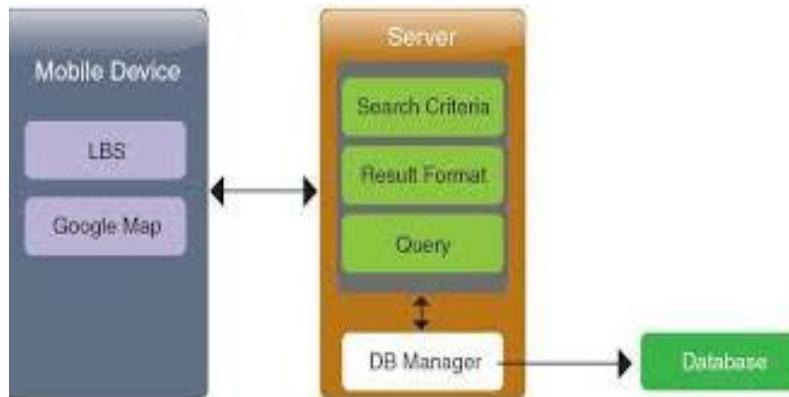

Figure1: System architecture of system

A. Building blocks of system

1) *GPS Technology:* Global positioning system (GPS) is system composed of 24 communication satellites of United states, which are originally used for military purposes and later allowed for commercial use. The satellites periodically emits signal of short pulses to GPS receivers .The GPS receiver receive the signal from at least three satellite to calculate distance and uses a triangulation technique [1] to compute its two-dimension (latitude and longitude)position or at least four satellites to compute its three-dimension (latitude, longitude, and altitude) position. Once a location is computed, it can calculate an average speed and direction of traveling. Therefore, GPS is a key technology for giving device its position.

2) *GCM:* Google Cloud Messaging for Android (GCM) is a service that allows you to send data from your server to your users' Android-powered device, and also to receive messages from devices on the same connection. The GCM service handles all aspects of queuing of messages and delivery to the target Android application running on the target device. GCM is completely free no matter how big your messaging needs are and there are no quotas.

3) *Google map:* Google map is very popular free software that provides maps by satellite images around the world[4]. Google map is version of Google Earth that shows the maps on-line using with a web server and a web browser. The program provides plug-ins for community to show objects in the program. Such objects are, for example, 3D objects of skyscrapers using Sketch Up software, pin objects to indicate a point of interest (POI),and line objects to show a track. To show such objects, Google Earth utilizes its own programming language called KML (Keyhole Markup Language) [5] which is an extensible markup language (XML) that is written to describe how the objects are rendered. The KML-based objects can also be used with Google Map to show line and pin objects.

IV .ALGORITHM

Android provides access to the above components to facilitate the implementation of (Location Based Services) LBS services through the help of following classes:
- Location Manager
- Location Provider
- Geocoding

A. Location Manager
Location Manager Class of android is present to manage all other components needed to establish a LBS system.

B. Location provider
Location provider represents the technology to determine the physical location i.e. to handle GIS. Location Provider component of Android application is a present to facilitate the determination of available provider and selection of suitable one.

Finding the List of Available Location Provider
To get a list of names for all the providers available on the device, call get Providers, using a Boolean to indicate if you want all, or only the enabled, providers to be returned:

Boolean enabled Only = true;
List providers=locationManager.getProviders(enabled Only);

In addition to this GPS provider and Network provider can be accessed directly by using the static variables defined in the Location Manager class:
LocationManager.GPS_PROVIDER LocationManager.NETWORK_PROVIDER

C.Geocoding
Reverse a way to convert geographical coordinates (longitude, latitude) into street address and forward geocoding provides a mean to get geographical coordinated from street address. For forward geocoding we use getLatitude() and get Longitude() method as shown is the following code Block:

Double latitude=location.getLattitude();
Double longitude=location.getLongitude():

For reverse geocoding we use get From Location() method with geocoder variable as shown is the following code block geocode is geocoder variable
addresses = geocod.getFromLocation(latitude, longitude, 10);

V. IMPLEMENTATION

A. GPS Tracking Module
The GPS Tracking Module is based on the GPS enabled android device. The android device must be based on version 2.2 or more. This type of mobile device can have the access to GCM service. Android Mobile in the vehicle gets its position using GPS. From that position we get the latitude, longitude & time. And we have to send that position to App Server through GCM. This process repeat after every 2 or5 minutes i.e. set by Admin of the system.

B.GPS Tracking –firmware

The firmware of the GPS Tracking module is written and compiled using an open source compiler.
The firmware performs three phases,

- Initialization,
- GPS position reading, and
- GPS data formatted and transmitted to GCM server via GPRS networks.

The initialization phase prepares the module for reading and transmitting location information. It is composed of three functions. The first function is to initialize the GPS Device for GPS reading. The second function is to initialize GPRS/GPS module to set up parameters to warm up GPS engine, to make a connection to a GPRS network and to connect to the GCM server via TCP/IP socket. The third function is to initialize MMC module into SPI mode for data read/write.

C.GCM server

Once the GPS Tracking Module is connected to GPRS networks, it transmits position information to GCM Server. The server has three functions to receive the information from the GPS device, to send the information to the application server, and to send the information to the client device when requested.
The receiving function opens a non blocking socket to receive data from multiple GPS tracking modules simultaneously.

D. Application server

The application server receives the information from the GCM server. The storing function formats the receiving data into our database that is designed to provide real-time location of the user. This location is sent to GCM server and GCM server will send the information requested by user.

VI. CONCLUSION

In this paper we have proposed a system or mobile application which will track the current position of the user and send it to the server which will send the requested information about bus stop & related bus information to user. The system will reduce the waiting time for travelling.

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