Weather Monitoring GPS

Varsha Dange, Girish Dawkhar, Ishwar Ethape, Pratiksha Jadhav, Gauri Kate
Dept. of Computer ngineering, DPCOE College of Engineering,
Pune, Maharashtra, India

Abstract: Global positioning system enables you to find the location Street Address, City, Country and Zip code. Google maps allow to find the desired destination location and finds distances between the source and destination place; also gives driving direction of the two cities and time required to travel.GPS navigation shows your way to reach the place with speed of travelling and different alternative optional routes and modes of transport andways to reach that place accordingly using the mode of transport selected.PeWemos is a system developed to provide weather condition using sensors; specifically designed to be as simple and intuitive as possible. Weather Monitoring GPS Application is finds nearby places provides you the list of all the nearby ATM's, Schools, Parks, Restaurants, etc.With just one click you receive the weather condition in your status bar at your current location as well different location. The climate state is highly animated so that you can almost experience it, seeing how the weather comes alive. WMGPS uses WWO Server as a data channel and the live updates of weather are fetched and Google Server to give the location updates respectively. Weather Monitoring GPS is thus a application which improvises the Google near Places and the weather application merged together so as to provide customizable reports of weather and locations in the same application to avoid the usage of RAM in the mobile equipment.

Key words: GPS, Geocoder, WWO Server, Google Server, Android, RAM, Mobile Equipment, OS.

I. INTRODUCTION

PeWemos uses sensors to get the information related to the climate for various places and thus provided the updates to the users. The Google maps also provide rough idea about certain locations to the users. In today's world, mobile phones have become an inseparable part of our lives. Mobile Equipment's applications help the users in every possible ways providing interactive environmentfor the user to ease his life by providing comfort. Different mobile device have different OS. Android smartphones have gained higher market in the 21st century. Android is open source and hence the developers can make wonders in developing various applications for different interesting and useful purposes.

Weather Monitoring GPS is an Android application which provides facility to find the results corresponding to weather and location in combination .There is no independent system application for the near places as well as the weather of that place so android user can interact with his choice. User has to use separate applications for both the purposes. To overcome from this problem rather using two independent applications we are presenting Weather Monitoring GPS Application as combination of these two applications as well as providing good user interface and the personalized application.

For implementing the above mentioned Application; the proposed system uses two servers
WWO Server
1. Google Server

WWO server will be used to add and track the weather conditions in multiple locations.Whereas the Google server will be used for generating the GPS for the location requested by the user. These two processes can be done simultaneously.Google server response is much better if internet connection is better User also get the his/her current existing location, can view location in themap with total street address and elements such as nearer places such as hospitals, ATM machine and etc.

II. LITERATURE SURVEY

Table 1 Literature survey

Sr. No	Name	Author	Year	Publication
1	PeWeMoS - Pervasive Weather Monitoring System	AislanFoina , Ahmed El-Deeb	**2013**	Journal Paper The American University in Cairo

2	Query By Impression: A Novel Place Query System with Adjacency	Chi-Yao Tseng Shih-Han Lin, Ming-SyanChen	**2013**	IEEE 14th International Conference on Mobile Data Management
3	Enhancement of Weather Monitoring and Near Places using GPS	GirishDawkhar,IshwarEthape,PratikshaJadhav,Gauri Kate.	**2015**	IJSRD

PeWeMos used WeboBuses to get the details of the temperature ie.weather of all the cities.The weather of only those places was recorded where the bus went. The climate conditions are recorded using the sensors kept at different locations which was very costly as well as inefficient to get the details of weather .In near places the vague idea about certain locations , streets , cities , etc. Enhancement of weather monitoring and near places gives all the details which is implemented as a proposed system in the weather monitoring GPS using techniques such as AQuery and JSON parsing .

III.   EXISTING SYSTEM

The existing systems are separate applications for the weather and the near places which give the rough ideas about locations, streets, cities without providing a particular search options. In the near places the user is not able to get connected to particular customized search for certain places like the schools, parks, shops, etc in the certain areas.
The live updates of weather with highly animated effects are not seen in the existing system. The existing systems are very costly due to use of sensors. As well the updated reports of the weather of all the cities is not provided.

IV.   PROPOSED SYSTEM

Searches nearer place as well as the weather of place we wish to make the application highly reliable, authorized and personalized. The application is asking for the credentials whenever user starts the application since it supposed to ask for an authentication.To personalize the existing system so as to maintain valid number of users for the application. We are wishing to maintain the user database and the no of requests made by the user in a day. To maintain request count so as to overcome server crashes. The Google server and WWO server has request limitations if the number of requests exceeds from its limit then there are chances that server may stop responding to the requests made by the user.

To provide authentication for users and keep record of total request made to the server. That is user can have privatization by means of authentication. Also trace the particular searched place as well as the weather of that place. The proposed system is planned in such way that it will not only trace the location but also its weather.

V.   SYSTEM DISIGN

System Architecture:
The WMGPS application should be installed on Android smartphone. As shown in above figure the smartphone contain the app which has multiple choices like My Location , Current Weather , Search , Daywise , Near Place. By using the GPS navigation in the mobile equipment user can connect to the servers to obtain required result.
Basically app uses two servers in which WWO server is used for retrieving the world wide weather information and for tracing location it uses Google server. Fetching the direct response is easy and less costly as compare to existing system. The flow diagram explains the flow of data throughout the system.
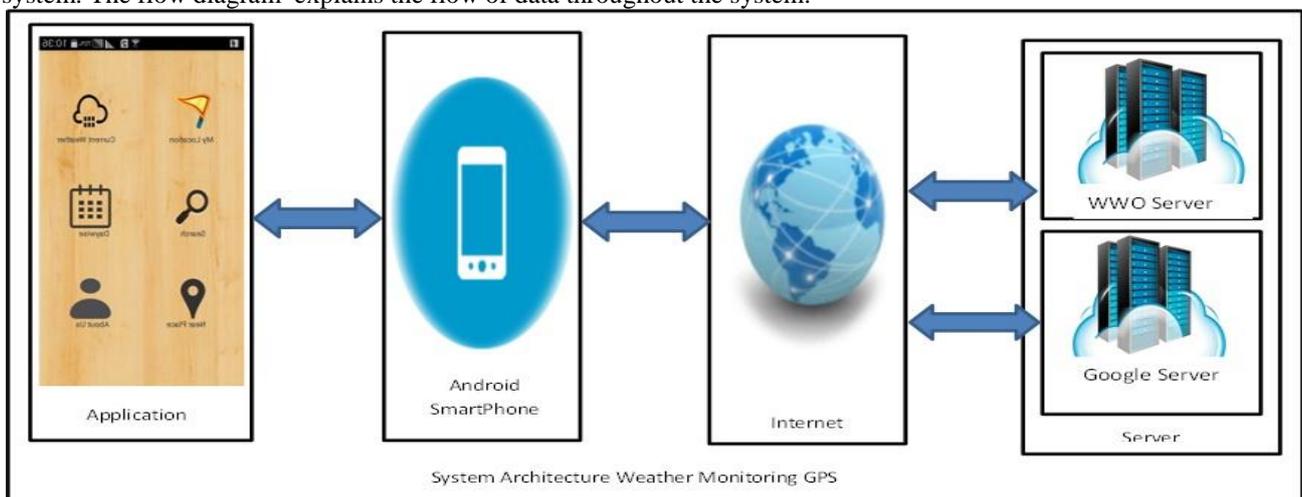

Fig 1. System Architecture WMGPS

Flow Diagram:

The user has to register to get connected to the application. Once the user is authorized he/she gets access to the application. Through the dashboard you get connected to the various captions like my location , weather, search, daywise weather, near places to get the updates of the weather and location on the same application.

Server/Database:-

All the registered users are stored into SQlite Database which maintains records of the users in local memory of the android device. All the location co-ordinates are fetched from the GPS. WWO server will respond to the requests for weather made by user. And Google server will respond to the location requests made by user.
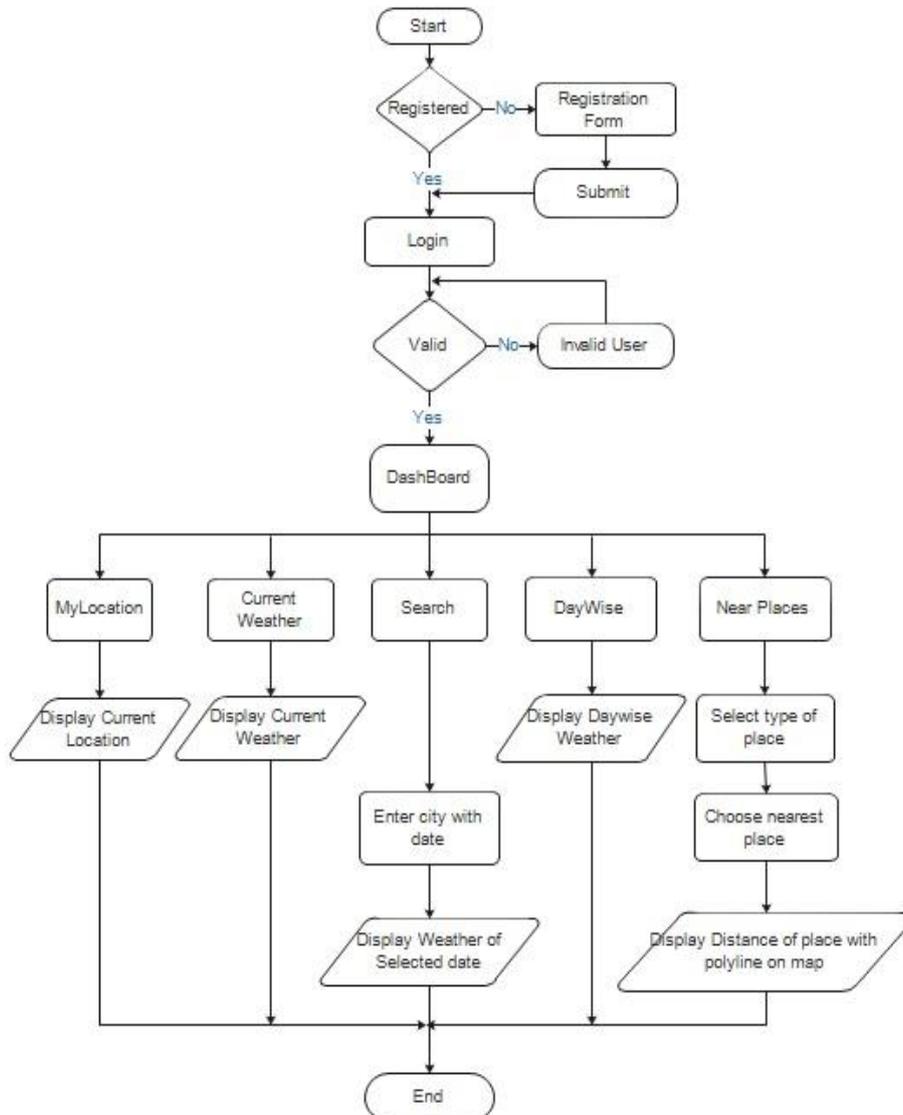

Fig 2. System flow
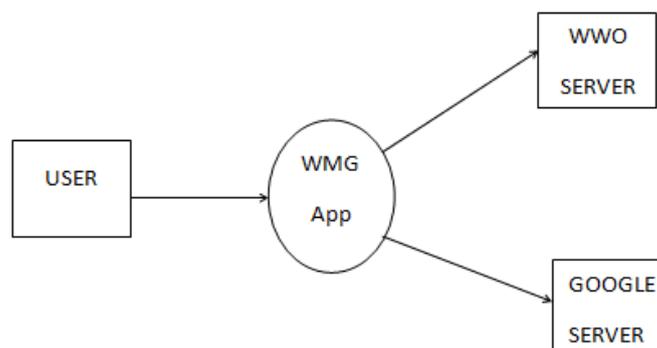
Analysis Models :
1. **Data flow diagrams**

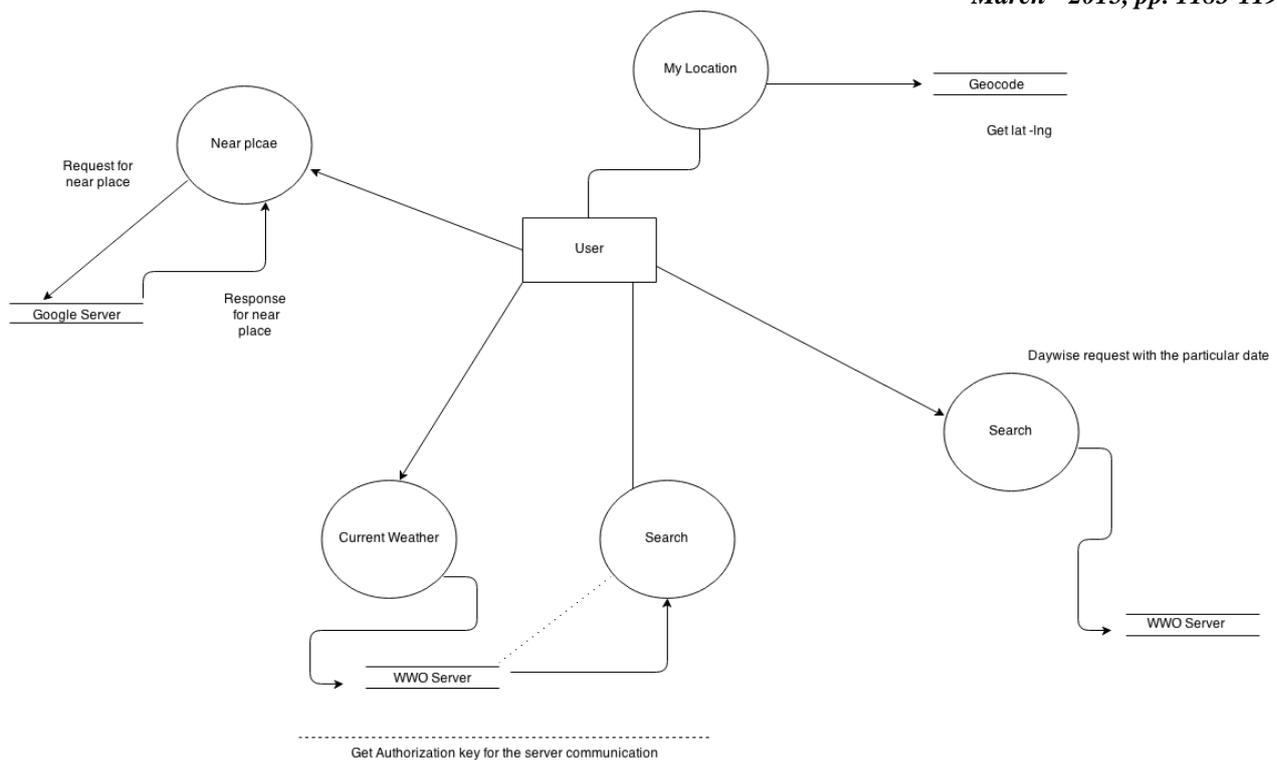
Fig 3. Data flow (level 0)

Fig.4 Data Flow(level 1)

VI. IMPLEMENTATION TECHNIQUES

Techniques required to implement Proposed system :

The application Weather Monitoring GPS is developed using Android. The proposed system is implemented using various techniques like AQuery, JSON Parsing.

Android-Query (AQuery) is a light-weight library for doing asynchronous tasks and manipulating UI elements in Android. Our goal is to make Android coding simpler, easier, and more fun. The features of Aquery can be explained as follows.

1. Less code
2. Light weight.
3. AJAX Callback.
4. Multiple UI.

JSON stands for JavaScript Object Notation.It is an independent data exchange format and is the best alternative for XML. This chapter explains how to parse the JSON file and extract necessary information from it.Android provides four differnet classes to manipulate JSON data. These classes areJSONArray,JSONObject,JSONStringer and JSONTokenizer. Thus JSON Parsing enables you to fetch exact amount of the required data by using particular JSON arrays and JSON objects. Advantages of using JSON Parsing are listed as mentioned.

1. JSON is a valid subset of JavaScript.
2. JSON parsing is generally faster than XML parsing.
3. JSON is a more compact format, meaning it weighs far less on the wire than the more verbose XML.
4. JSON is easier to work with in some languages like javascript.
5. Formatted JSON is generally easier to read than formatted XML.
6. JSON specifies how to represent complex datatypes, there is no single best way to represent a data structure in XML.

Important Modules in WMGPS :

User don't know the internal working of the project . For example- he only knows the how output of this project but he / she cannot understand the functional flow and its API used in this project . The classes are used in the project to enable various functionalities to the modules of the project. Now moving forward towards the project modules the following are the classes involved in the project activities.

1. Login
2. Address
3. By city
4. Current weather
5. Near Places
6. Daywise

Firstly user has to login with his credentials so as to authenticate the user if the user enters the incorrect password then the proper authentication is checked by this class and when the user enters a correct password then he/she can see the dashboard which having the four options as per the app requirement.

Address class is used to get the address of the location by tracing the latitude and longitude of the place. The geocoder method in the class is used to access the location. Similarly the by city class is used to get the weather of the current city selected by the user. The current weather class retrieves the current weather of the place by tracing the latitude longitude of the place. The daywise class gives the daywise weather reports of any particular location in terms of temperature, pressure, rainfall and other parameters. The near places caption is used to determine the near places which are traced by using the latitude and longitude.

Operating Environment :
The operating environment required for the project can be classified using the following set of points:-
1. OS-Windows 7/8 with eclipse – JUNO
2. Software- JDK 1.7 , ADT bundle
3. Android smart phone

Assumptions and Dependencies
The Application development needs the following third party products as listed below:-
1. We are using Google near place API to get the near places according the latitude and longitude with some radius.
2. Also we are using WWO server (World weather online) to retrieve the weather conditions of any particular place by giving the latitude and longitude of the place.
3. thegeocoder method is used by both the google server and the WWO server so as to get the current location by mapping the latitude and longitude of the place.
   The dashboard has the following captions like
1. Address is used to get the address of the location by tracing the latitude and longitude of the place. The geocoder method in the class is used to access the location. Similarly the by city class is used to get the weather of the current city selected by the user.
2. The current caption class retrieves the current weather of the place by tracing the latitude longitude of the place.
3. The daywise class gives the daywise weather reports of any particular location in terms of temperature, pressure, rainfall and other parameters.
4. The near places caption is used to determine the near places which are traced by using the latitude and longitude. This functional requirement can be stated as

Description: Dashboard screen has the five tabs as
1. User address
2. Map
3. Current weather
4. Day wise report
5. Near places

Priority 2: High

Dash board :
Only the authenticated user's who have successfully logged on get access to this dashboard. This dashboard is a multiple choice board which is just like a home page of some website where u can get linked to various captions under same interface. The captions on the dashboard have designed for the following set up as listed below:
1. **My location:**
   This caption is used to trace the location of the point where user is standing by recording the current latitude and the longitude through geocoder. For example whenever the user clicks on this button the user is able fetch his/her exact location at the current point of time. This caption retrieves the location of the user requesting at the any corner of the world.
2. **Current weather:**
   This caption is used to give the current position's weather with all the values of different places. For example whenever the user clicks on this button the user is able fetch his/her exact current weather at the current point of time. This caption retrieves the weather of location of the user requesting at the any corner of the world.
3. **Search:**
   The search caption is used to search any of the location requested by the user at the real time .User can search any desired location of his choice. Hence this menu provided so as to meet the increasing demands of the user in day to day life. This menu is very useful when the user wishes to travel to a new place. The user can search the place of his choice earlier beforehand.
4. **Near Place:**
   This tool on the application is used to get the near places in the area. Through this caption we are trying to provide the user with all the near by places such as Atm's, Banks, restaurants, hospitals, schools, Parks etc. Hence this

caption proves to be beneficial when a user goes to a new area and has to go to different nearby places in the new area. User can also make his list of consistently travelled or favorite near place.

5. About Us:

This caption is just used to provide the information about us(developers) so that the user is able to contact us for any kinds of queries and feedbacks.The dashboard is just like a menu bar where user is enabled to get various features and menus on the application. The front end of the application's dashboard is as shown in the fig. 3 shown below
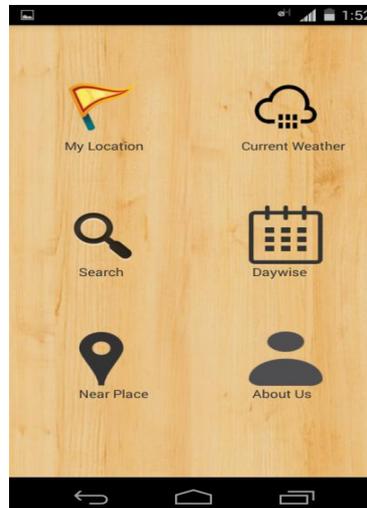

Fig.5 Dash board

Search Module design :

User by clicking on the search caption on the dashboard gets connected or linked to this UI. This UI consists of three fields like Address, City, and Country. Using this UI user is able to search the address regarding to his choice just by entering the details into the fields he will be able to visualize the searched place on to the map. The frontend of the UI is shown in the fig 3.2.3
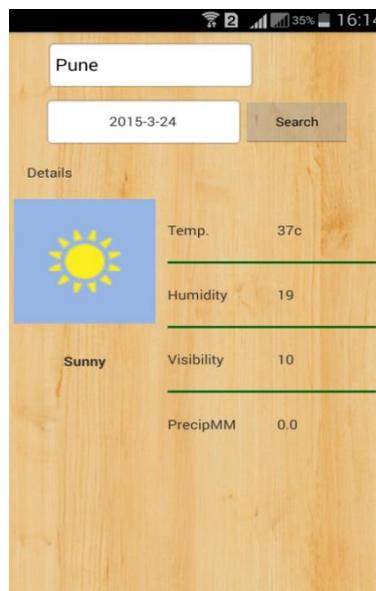

Fig .6 Result of Search

VII . TECHNICAL REQUIREMENT

Hardware Interfaces:
The Hardware Interfaces required for the application to operate are as listed below.
1. Mobile device with android framework.
2. Computer machine with all other parts like CPU, Keyboard, Mouse.

Software Interfaces:
The Software Interfaces required for the application to operate are as listed below.
1. Andriod Framework
2. Android Application development kit.

Communication Interfaces:
The Communication Interfaces required for the application to operate are as listed below.
1. WWO server
   The WWO server returns the World's Weather Online once the latitude and longitude is traced of the user using the application.
2. Google server
   The android device makes a call to the Google server which in response returns the latitude and longitude coordinates.

VIII. SYSTEM FEATURES

Advantages:
1. Personalized system than the previous one.
2. Efficient session management by Maintained request count.
3. Determines weather of traced place.
4. Secure system.
5. Compatible for all versions of Android

Limitations:
1. It is platform Dependent .
2. Internet Connection required.
3. Limitations of Requests .
4. Smart phone should have Android .

Results:
 The monthly weather reports for the year 2014 in term of temperature using weather monitoring GPS is graphically represented as follows :
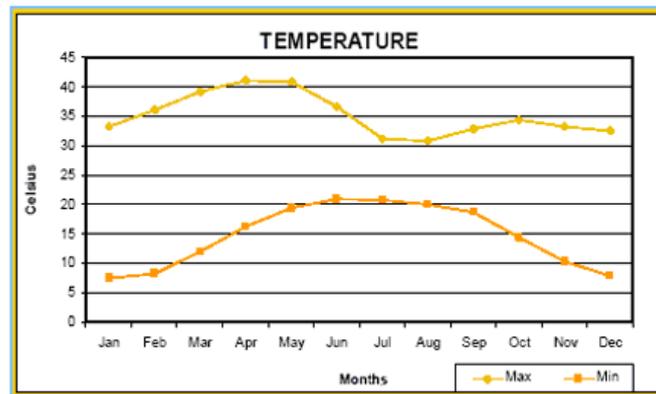

Fig.7 Graph for Weather Analysis using WMGPS

The list of resultantnear by places like ATMS shown in the vimanager Pune area are traced using the Weather Monitoring GPS :
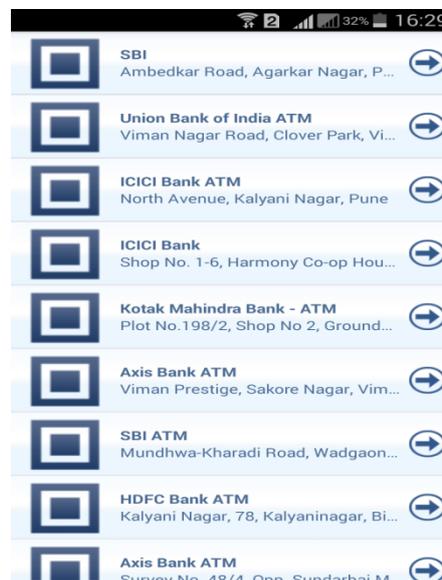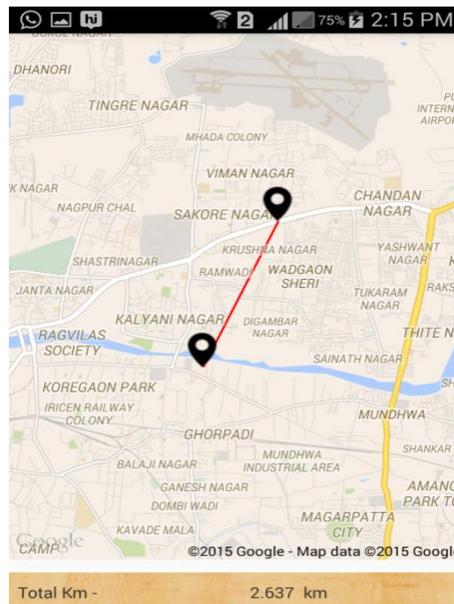

Fig. 8 Result Set for near by ATM Using WMGPS

Fig. 9 Particular ATM location on Google maps

The above shown results are shown for particular search as the WMGPSapplication is interesting you can get various other locations daywise and datewise weather reports and many frequently visited places. Thus the application is fantastic and handy to use.

IX. CONCLUSION

The existing system provides the details related to the temperature, pressure, rainfall and climate as well as the location each in a separate application. In Weather Monitoring GPS provides authorized access to the server by accepting the valid credentials thus making application personalized by maintaining the records in the SQlite for local memory of the device. Weather Monitoring GPS provides customizable reports of weather with highly animated pictures providing live idea about the weather and locations by providing facility to search near by places like ATMS, public parks, schools and search the favorite places by entering the address by city. Weather Monitoring GPS is thus an android application which provides highly updated results of the weather and the location using the new techniques like AQuery& JSON make the user to highly interact with his choice in the single application utilizing the RAM of the android device efficiently.

ACKNOWLEDGEMENT

The development of the application "Weather Monitoring GPS" has given us immense pleasure and knowledge. We are sincerely thankful to the project guide Prof. Varsha Ma'am who have cooperated with us at different stages during the preparation of this application.Our sincere thanks to the staff of Computer Engineering without whose help it would not have been possible for us to complete this report. This work is virtually the result of inspiration given by them.We would also like to thank all the library and the non-teaching staff for their help and last but not least we would like to thank all out friends for their constant help and support.

REFERENCES
[1]   AislanFoina, Ahmed El-Deeb,"PeWeMoS - Pervasive Weather Monitoring System" Laboratory of Microelectronic, Universidade de São Paulo Brazil,The American University in Cairo

[2]   Chi-Yao Tseng, Shih-Han Lin, and Ming-SyanChen,"Query By Impression: A Novel Place Query System with Adjacency **Constraints**" , Research Center for Information Technology Innovation, Academia Sinica,Taipei, Taiwan, R.O.C., Department of Electrical Engineering, National Taiwan University,Taipei, Taiwan, R.O.C., ,2013 IEEE 14th International Conference on Mobile Data Management .