

Location Based Services Using Data Mining For Mobile Users

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Abstract- Data Mining aims at discovering interesting and useful knowledge from the database. Conventionally, the data is analyzed manually. Many unrevealed and probable useful relationships may not be identity by the user. Through data mining, we can extract interesting knowledge and regularities. This Mobile Application using the Data Mining approach, to locate the nearest famous location around a particular area. Using the data mining approach, it extract the database with the help of different data mining algorithm. This location determines the nearest by wireless networks. It provides the fresh data using the open source android OS. You can sure that the information you received is up-to-date. Android gives a world-class platform for creating apps and games for android users everywhere , as well as an open market place for distributing to them instantly.

Keywords- Wireless network, GPS, Data Mining Algorithm.

I. INTRODUCTION

These 21st century mobile devices permit users to establish phone calls and other activities from any place. With the extreme growth of the World Wide Web, the people's need to be connected to the Internet all the time increased and these devices proved to be extremely restrictive. As the variety of such needs increased, the new breed of smart devices was needed that had capabilities to run customized/specialized applications to fulfill a user's computing and connectivity needs. These new devices were called **Smartphones**. They featured music players, camera, photo/video surfing programs, games, etc., as other possible applications. These smart phones are low powered, energy constrained computers which required a light-weight but highly efficient operating system to run all of a user's applications. The term which everybody knows Android the exact meaning in Greek is andr- means man or male and eides- means alike or the species. That means human being. Android is a software platform and operating system for mobile phones which is based on Linux kernel. Its is a open source code and Google released all the code under apache licensed in 2008.

II. LOCATION BASED SERVICES

Location Based service is come up as a killer application in mobile devices. Location Based Services basically is used for the information of the mobile user using mobile devices network and utilizing the ability to make use of geographical position of the mobile devices. LBS include services to identify the location of a person or object, such as discovering the nearest hotels, restaurants and ATMs or the where about of a friend or employee. LBS services include parcel tracking and vehicle tracking services.

LBS have two major actions, that is:

1. Abandoning the location of user.
2. Utilizing this information to provide a service.

Location Based services is divided into two categories: Push services and pull services

Push services it basically known as delivering the information which are either or in directly requested from the user. Such push services are activated by an event, which could be triggered if the user enter into the new area for example if the user enter into the shopping mall the new events of the shopping mall are Push up on the user mobile or if the user enter into the new area the push services subscribed the weather information on the user mobile. Here the Background information like users need and preferences have to be sensed by push services.

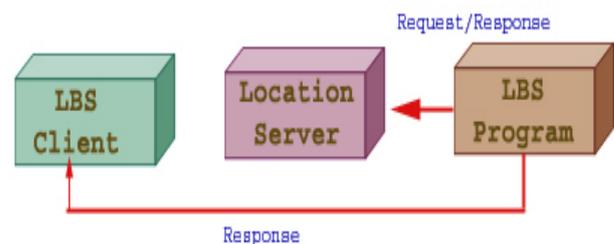


Figure. 1 Push Services



Figure. 2 Push Services on Mobile device

In this fig , when the client enter into new area the new events or some offers around the nearest place of the client is subscribed on the clients mobile devices automatically.

Pull services is describe by delivering information directly requested from the user. This is same as to call a website in the internet by fill in its address in the web browser- address field. for example by ordering a taxi or ambulance by just pressing a button on the devices.

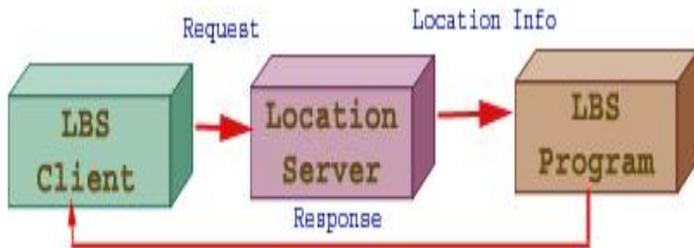


Figure. 3 Pull Services



Figure. 4 Pull Services on Mobile Device

In this fig the client request the query to the server and the LBS program gets this information from location server and sends to client according to their request.

III. How IT WORK ?

Location based services work on the principles of Location Tracking technology. Location Tracking is not one, single technology. Rather it is the convergence of several technologies that can be merged to create systems that track inventory.

Current Technologies being used to create location-tracking and location based system include-

A. Global Navigation Satellite Systems(GNSS)

Global Navigation Satellite System receivers using GPS or Galileo system are used in many application to gather the location information. The Receiver detect its geographic locations from signals and it receives from different satellite by using triangulation rule. Global Navigation Satellite System is a form of location based services terminal.

B. Cell ID

Cell ID is a unique number used to detect each base transceiver station or sector of code a BTS within a

location area code. It is the simplest way to describe the general location of a mobile users. Basically it describe the base transceiver station for the mobile which we use for the commutation. Is this information is available the location server identify the mobile device location as being the location of the base station and sends this information on to the location service application.

C. Geographic Information System (GIS)

GIS allows us to view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts. The benefits of GIS generally fall into five basic categories:

- Cost Savings and increased Efficiency.
- Better Decision Making.
- Improved communication.
- Better Record Keeping.
- Managing Geographically.

D. Global positioning system (GPS)

GPS is a space based satellite navigation system that provides location and time information in all weathers anywhere on or near the earth, where there is an unobstructed line of sight to three nearest GPS satellites. It was first developed by united states department of defense. GPS satellites orbit the earth every 12 hours at an altitude of approximately 20.200 km. Each satellite contains several high-precision atomic clocks and constantly transmits radio signals using a unique identity code. The GPS localization principle is based on Time of Arrival measurements.

Few steps of calculating the users location:-

Step 1: The basis of GPS is Triangulation from satellites

Position is calculated from distance measurement to satellites

Step 2: Measuring Distance from Satellite.

Accurate timing is the key to measuring distances to satellite.

Step 3: Getting Perfect Timing.

The error information is sent to satellites, to be transmitted along with the timing signals. Satellite positions are continuously monitored

Step 4: Satellites Positions

Both the satellite & receiver are generating pseudo-random codes at exactly the same time.

Signal arrival time= Sync receiver time- Sync of satellite time.

Distance= Velocity * Signal arrival time

A few drawbacks of GPS is cover up by launching new technology i.e. Hybrid Technology

It also Known as Assisted Global positioning system. It launches because of GPS have poor performance in too many situations (indoors, in urban areas Etc). GPS drains too much power from the devices. By using Hybrid technology it eliminates many of the cost imposed by GPS on handset. It also reduces the delay in calculating location offers some control to user. In some smartphones they use hybrid position Systems that combines Wi-Fi positioning system and cell site triangulation which improves the reliability and performance of the location services. And some GPS positioning system is used in car navigation systems.

IV. WHY JAVA LANGUAGE IS USED FOR LOCATION BASED SERVICES.

- Java is a powerful object oriented language for developing flexible, platform – independent components for highly scalable systems .java language runs on all platform and is optimized for portability.
- Java language has features to facilitate debugging and avoiding error.
- Java provide the security for class loader and byte code.

V. LOCATION BASED SERVICES USING DATA MINING

Data mining is used to gather the important information from the raw data base which is useful in location based services. It is done by sending a mobile device to the location Based services and then mobile devices performs the classification mining in the raw databases. The result is send back to users mobile to provide the location information. Another method is sending the data to the mobile user and then Perform the data mining techniques. The architecture of location based services on Multi-agent. Muti-agent is used for the efficiency of location services by using the near around places search on the hierarchy of the base station. Association mining is used for saving all the previous activities of the mobile user. The framework of the location based services include of four components as follows – location agent manager, data compressor agent, sensor agent and user agent. The user agent is saved in mobile devices and it starts retrieving the data when it enters the new area and detect the location agent manager of the location based service. And the first location agent manager communicate with the another location agent manager and shares each services according to the agents request. Wireless sensor are scatter within the users location and collect all the important information of the location like weather , new events occur in the area etc.

And this information is stored in database. Sensor agent is managed by Location agent manager. After sending data from the data composer agent , the user agent interpret the data and convert it into the relevant data .

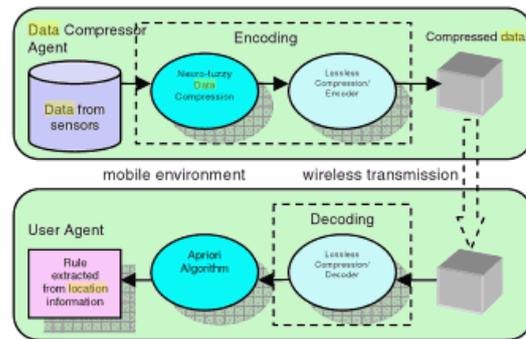


Figure.5 Working of Location Based Services

VI. SIMULATION OF DATA MINING

Data mining is performed on the main memory of the data base. The running time of the data mining algorithm is not significant. In the whole system it Depend on three components – the rule extraction model, broadcast organization model and broadcast simulation model.

The rule extraction basically works extracting the sequential rule from the web log. The Resultant of extracting the Sequential rule are stored in the specific format for the future use of the broadcast organization and broadcast simulation model. The broadcast organization Model Perform the clustering of data items.

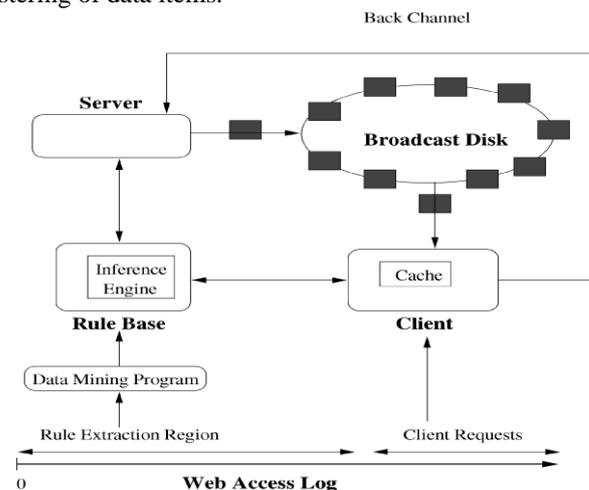


Figure. 6 Working of location Based services using data mining

As Shown in the above figure, the client sends the request to the web log and the web log access some rule based algorithm for extracting the data. If the data is present in the client cache it Dispatch it otherwise it call to the server for broadcast the channel. The broadcast Channel detect the data on the server and transfer it on the web log. And the Client Retrieve the data.

VII. CONCLUSION

In this paper we discussed about the location based services using different technologies. The location is gathered by different technologies for example using Global positioning system, Cell Id, Geographic information system etc. Association mining rule is broadcast the data form the server. This application is more Flexible. Finally we conclude that for

every location service, to assist with the exact information ,at right place in real time with personalized setup and location sensitiveness. We have a vast number of applications and usage where a person sitting in any area and needs the relevant data and information. And this application extracted the data from the server by using extracted mining rule by firing the query

VIII. FUTURE SCOPE

In coming years, we will see the large quantities of internet worked, position – aware, wireless objects capable of movement. for example :

Users using internet enabled mobile devices with enhanced display, tourists may carry on-line and position- aware “cameras”, “wrist watches” and “clothing”.

Vehicles with computing equipments, include automobiles , luxury cars also carry navigation equipment and a wide range of such equipment is available for users to integrate the older vehicles to new vehicles. The ease of Location based services in Business, it will improved the Customers lifetime values. Increased value of current Application. Google have launched new feature on location based services, introducing the options to get multiple stage directions. It updates the affects of Google map preview in our desktops.

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