

Ruling the Remoteness of Associates and Kin Using Cellular Phone with Latitude Radius Algorithm

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Abstract -- LBS are the mobile services in which the user location information is used to provide a service. Providing Location Based Service (LBS) using Global Positioning System (GPS) as a location provider. The main objective of this work is to design and implement a client server system that helps users to locate their family members and receive alerts when friends are nearby. The server was implemented using JSP since JSP guarantees that the server would not be overloaded. The type of the Database used in the system was Oracle 10g. The average location accuracy of the application is about couple of meters .It was developed mainly to be used in navigation systems. Because of the reduction in the size of the GPS receivers and because of the integration of GPS with some mobiles; GPS became one of the most important service providers in the LBS. The main objective of this work is to design and implement a client server system that helps users to locate their family members and receive alerts when friends are nearby.

Keywords-component: *Location based service, Global positioning system, Latitude Radius Algorithm.*

I. INTRODUCTION

LBS are the mobile services in which the user location information is used to provide a service. The user location information consists of X-Y coordinates generated by any given positioning technique such as Cell-ID, GPS, etc. The GPS is the most efficient positioning technique. It was developed mainly to be used in navigation systems. GPS became one of the most important service providers in the LBS. This paper presents a mobile application based on providing Location Based Services (LBS) using Global Positioning System (GPS) as a location provider.

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navigation systems. Because of the reduction in the size of the GPS receivers and because of the integration of GPS with some mobiles; GPS became one of the most important service providers in the LBS.

II. PROPOSED SYSTEM

The application is implemented as a client server system that helps users to locate their family members and receive alerts when friends are nearby. The location average accuracy using this system is believed to be within couple of meters. The application works in open space areas only since it relies on GPS. The system built is portable and can run on any mobile phone that supports J2ME whether they support the new JAVA location API or not. The system can run on mobiles that have a built in GPS receiver or mobiles that support Bluetooth which can be used to connect the mobile to external GPS receivers. GPS does not work indoor. This problem was solved by always storing the last location updated by the application. The system provides the user with the member time of update whenever a family member location is requested. This will help the user to know whether the location is recently updated or not.

Advantages

- ✓ The system can run on mobiles that have a built in GPS receiver or mobiles that support Bluetooth which can be used to connect the mobile to external GPS receivers.
- ✓ On the mobile side, the application size is small because all user lists and other data are stored in the server.
- ✓ The system provides the user with the member time of update whenever a family member location is requested. This will help

the user to know whether the location is recently updated or not

III. SYSTEM ARCHITECTURE

The internet is the medium that will be used to transfer user data and service request from the mobile to the server and then the requested information back to the user. The main 5 elements that construct the system which are the GPS, the client tier, server tier and the database tier.

A. Client Tier Module

The mobile requests its location from the positioning system periodically and sends it through the communication network to the server. The user can request the location of a family member at any time from the server. Also an alert can be received whenever the user and a friend are in the same location.

B. Server Tier Module

The server receives users' location and alerts two friends if they are in the same location or update the user about the location of family members.

At the client level we have either a Java client application or a web browser as the client. By using a web browser as the client allows the entire application to be located on the server. The client always gets the latest version when they start the application. Also the client can use any web browser from any location provided that they can connect to the application server. The client tier can also consist of an application running on the clients' desktop (usually presenting a rich user interface) and connecting directly or through HTTP to the application server. This requires that the client have the application installed on their desktop.

C. Database Tier Module

The database contains all users subscribed in the service with their location, a list for each user that contains friends and family members that can be located, and a table that contains locations with their coordinates.

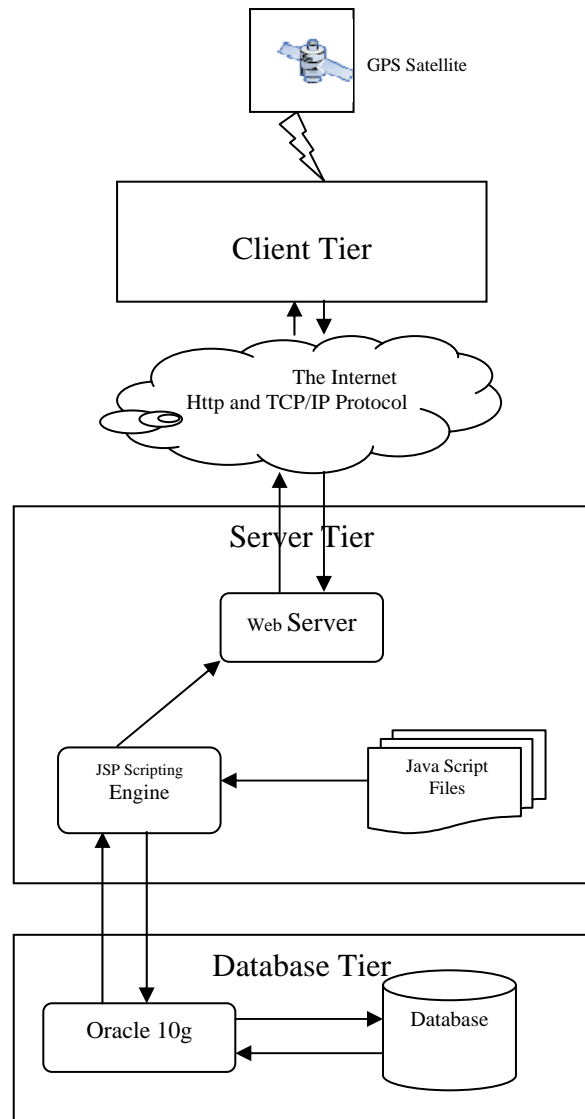


Figure 1: system Architecture

Users Table: This table stores all the users with their login information and location.

User friends and family lists Table: This table stores the lists of all users that use the service.

Locations table table: It contains Locations name with their corresponding coordinates.

D. Global Positioning System (GPS)

Every time the mobile phone updates the user location in the server, it requests the location of the user from the GPS.

The Global Positioning System (GPS) is currently the only fully functional Global Navigation Satellite System (GNSS). More than two dozen GPS satellites are in medium Earth orbit, transmitting signals allowing GPS receivers to determine the receiver's location, speed and direction

IV PROGRAMMING DESIGN LANGUAGE

A. User Login

Inorder to use the service the user should register by providing a username and password.This information will be sent to the user.

```
Pseudocode
GET username and password from the user
CHECK whether the username and password
matches with the existing data in database.
If found then
    Redirect the user to home page.
Else
    WRITE error message "Invalid
username/password" on the screen
End if
```

B. View friends

A User can retrieve the location of a family at any time with the distance between both of them and the last time the family member updated the server with his/her location

```
Pseudocode
GET the friend id from the user.
If the input ID is not a valid , Then
    WRITE error message "Invalid ID"
Else
    View the friends profile with the access
permission.
    FIND the suitable profile with their
database.
    CALCULATE the distance and the route for
each user from their location.
    CONVERT longitude and latitude values
into distance.
End if
DISPLAY exact location.
```

V. THEORITICAL FOUNDATION

Latitude Radius Algorithm

This algorithm uses around Earth Orbit satellites that transmit precise signals.This system enables a GPS receiver to determine its location,speed and direction.

Calculating Positions

To calculate its position, a receiver needs to know the precise time.The satellites are equipped with accurate atomic clocks while the receiver uses the signals that are coming from the signals.

$$\text{Distance} = a \cos \left[\cos(\text{latA}) * \cos(\text{latB}) * \cos(\text{lonB} - \text{lonA}) + \sin(\text{latA}) * \sin(\text{latB}) \right] * R$$

VI. IMPLEMENTATION

This application was implemented using JSP and the server functions was implemented using Oracle 10g for the database.

To make sure that the application can run on almost mobiles ,two different methods for dealing with GPS receivers were used.

VII. CONCLUSION AND FUTURE WORK

This application based on providing Location Based Service using Global Positioning System (GPS) as a location provider is presented. The application is implemented as a client server system that helps users to locate their family members, Include maps, to locate a family member location rather than just sending the location name. The application works in open space areas only since it relies on GPS.

Limitations of the System

The application is implemented as a client server system that helps users to locate their family members and receive alerts when friends are nearby. The system built is portable and can run on any mobile phone that supports JAVA jar files whether they support the new java location API or not. The system provides the user with the member time of update whenever a family member location is requested. This will help the user to know whether the location is recently updated or not.

Future Enhancements

This paper with an emerging technology of GPS in future can implement to support all types of Mobiles that supports java jar files and inbuilt GPS etc.The system in future can be implemented in such a way that the service can also be accessed through mobile and other type of portable devices

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