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Location Based Messaging

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Abstract: In today's world of smartphones and tablets, many services can be provided using the location of the user using GPS sensors and it plays a vital role for navigation etc., and almost all smartphones come equipped with GPS sensors. The scope of this project is to build a location based instant messaging android application based on the location of the user. A Real-time example is a chat application to share information in a university area to the students via location to reach all the users in the university without any mobile registration or email and only purely by their location. If they are in the proximity of the university, they will be able to see all the messages if not they won't be able to read the messages. The existing instant messaging application like whatsapp, telegram, hike we require mobile number, mobile number verification etc., but this model eliminates those problems and give ids to the user only based upon the location, so there will be a larger reach without knowing ones' mobile number. This application provides an interface to share any information to the users in the proximity of receiving the messages in an anonymous way without knowing ones contact details.

Keywords: Geofencing; Location based services; Location based messaging; Android; GPS

I. INTRODUCTION

Location based service(LBS) is a very popular and emerging trend in today's world and provides a ton of applications in mobile data services thanks to advancement in wireless communication and location positioning technologies. Users who utilize the location based technologies like GPS in their mobile can query about their surroundings (e.g., finding the nearest restaurant, shopping malls within the prescribed location, finding the nearest petrol stations, ATMs etc. at any place and at any time. This service is hence ubiquitous i.e., on-demand service brings great convenience for information access. The challenges to Location based service (LBS) include constraints of mobile environments, the spatial property of location-dependent data, and the mobility of the users. A Location Based Service (LBS) is both an information and entertainment service, accessible with mobile devices through the mobile network and utilizing the geographical position of the mobile device. A LBS service can be used in variety of contexts such as healthcare, marketing, media, important emergency broadcasts sent by the government to the people who are in a particular location e.g. identify the location of a person, weather information, disaster warnings, finding the nearest cab etc. This also includes the application of tracking parcels in logistics and vehicle tracking services too.

LBS have two major objectives that are:

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

These 2 objectives determine the type of service provided and the expected outcome.

II. BACKGROUND/RELATED WORKS

For determining the location of the user automatically there are various mechanisms available and are in use today. These techniques are classified into two types, one which is suitable for finding location in outdoor environments and other in indoor environments. Capturing the location of the user in outdoor environments can be done in three ways: (i) finding the location based on the mobile device built in capability i.e., using GPS, (ii) finding the location based using the mobile cellular network and (iii) use the combination of both the above techniques. The first technique determines the user location through GPS, GPS captures the signals from the satellites to capture the location information. It gives highly accurate location information and doesn't require any additional infrastructure to work. It provides enhanced privacy to the user. However, this technique doesn't work in indoor environments and there will be some delay in computing that location. The second technique used to determine the user location is through the Cell ID of the cellular



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network. This technique uses the location of the base station of the network operator to find the location of the user. It is a low-cost mechanism and hence no modification is required to the mobile handset. However, the accuracy of the location is low when compared to the GPS technique. The third technique to determine the user location is using the combination of the above two approaches. Assisted GPS is a hybrid approach of this type, in these technique GPS receivers that are rooted in the mobile cellular network helps in assisting to get the location information by reducing the computing burden. Apart from GPS most of the other techniques are not widely implemented. Regarding the indoor techniques to find the user location of mobile handset are difficult to implement as there is no sight with the satellites. Indoor techniques are mostly suited to PC and laptop users where the information about location can be fetched from Infrared/Bluetooth or Wi-Fi. Hightower and Borriello's six attributes (2001) are used to distinguish the techniques to determine the location. The six attributes are:

2.1 Physical Position and Symbolic Location

GPS receiver gives the physical position in terms of Latitude and longitude values, whereas the symbolic location indicates the target device being in some nearby place or in a room.

2.2 Absolute vs. Relative

Absolute gives the exact the location of the handset in terms of latitude and longitude whereas Relative gives the location with reference to other objects.

2.3 Localized Location Computation

Information are supplied by the network to compute its own pros as no other object knows the location of the device until the device reveals this information.

2.4 Accuracy and Precision

The details instead of locating the position how often the system records the accurate position.

2.5 Scale

Scale refers to the size of area within which the object location is achievable and Borriello suggests assessing scale in infrastructure and the number of objects that can be located per unit.

2.6 Cost

Different location sensing systems varies in their costs. There are lot of costs involved in usage of location sensing system like time costs, maintenance costs and space costs.

III. LITERATURE SURVEY

The aim of reviewing the components was so that the devices with security strengths can be used to develop a security model that can determine its location for which positioning using the mobile user can be used to grant access to the network. Use of Geofencing in security strategy model gives security to wireless local area networks [1].

3.1 WhatsApp Survey

WhatsApp has become therefore cozy/ comfortable an application among kids [2]. Currently WhatsApp is getting used by youth for creating, sharing and exchanging information.

3.2 Robustness Security and Privacy of Location Based Services

Our survey shows that many solutions are available for improving robustness, security and privacy of LBSs in IoT. Often, they come with significant overheads and require [3] specialized expertise to be implemented correctly which, arguably, are reasons why they are not included at the moment.

These requirements are hard to meet technically- particularly using the W-CDMA technology chosen for UMTS. However, at the IEE 3G Mobile Conference in London in May 2002, key suppliers believed that they had found techniques that got close to meeting these requirements [4].

3.3 Location-Based Messaging Systems

- Internet-based instant messaging (IM) has already proven to be one of the most popular internet applications. Location-based instant messaging is a natural extension of internet based instant messaging those benefits from the huge existing market for IM. In location-based messaging, each message is associated with a location, which can be either the sender's current location or a manually input location Specification [5].
- Client application of Mobile New.

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- Concept displays the positioning data retrieved by above principle on the Google Map [6].
- It is an instant messaging system based on location. Servers can classify and group the information automatically, then send them instantly according to the location. This system can be used to communicate; location based instant message sending, tour assistant, etc. [7].
- The location-based mobile messaging applications have won people's favor and enjoyed a large user population. However, the developers' failure in the lack of full control of resolving the trade-off between functionality provision and user privacy preservation results in some unnecessary privacy threat [8].
- An OTP refers to set of numeric or alphanumeric character strings that are generated automatically and is used to authenticate the user for a single transaction or session to an authentication server. OTP enhances the traditional username and authentication by adding a dynamic level password that changes each authentication [9].

IV. PROBLEM STATEMENT

In today's world of Instant messaging applications like WhatsApp, telegram, hike, we require ones mobile number to message them or we need the chat link of the group to join a particular group. This creates a problem to reach mass audience around a location to share instantaneous message to people nearby, which is impossible because of the use of mobile number.

V. PROPOSED SYSTEM

To eliminate the problem, we are implementing a messaging environment to message to people without the use of their mobile number and by using their location of the smartphone and thereby connecting them to common group chatroom, this chatroom consists of all the people who are in the current specified location boundary. By this way we can eliminate the use of mobile number. This system, we are developing to implement in our university campus, to send messages between students and faculties who are in the vicinity of the university campus, these messages will be only sent to the person, if he is in the college premises. The implementation is that, we are building an android application which uses the GPS sensors in their smartphones to locate their position and once if it's within the campus boundary, it will connect their device to a common chat room which is running in the back-end server. Once connection is successful, communication happens between the students/faculties inside the campus premises (Figure 1).

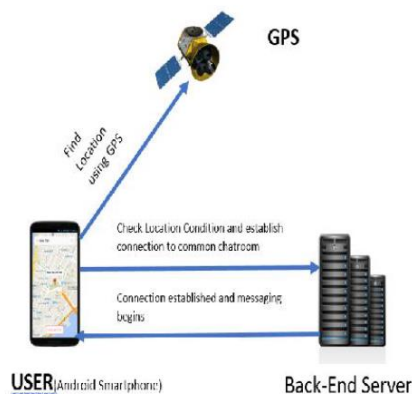


Figure 1: System architecture.



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VI. FUTURE SCOPE

This system of location of based messaging can be further expanded to larger area, for example a city, where people all over the city can engage in a single social environment to communicate the current issues in their location, traffic updates, available offers in local shops/malls. This also opens to a new upcoming title called as location based marketing, where in people get notification and messages about the offer details in restaurants, shopping malls.

VII. CONCLUSION

In the ever-growing world of smartphones, location based services(LBS) has a great potential and can open door to lot services from location based marketing, location based notifications, location based messaging as we have developed one, other examples include nearby restaurants, nearby ATMs, nearby hospitals and so on. We conclude by saying that location based services will be in huge demand in the upcoming years and can offer a lot of benefits to both individuals and organizations.

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