Android Based Location Reminder Using Geofencing

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Abstract: A geo-fence is a virtual fencing for a real-world implementation in a geographic area. Geofencing is a feature that uses the current location of the user as per the geographical boundaries. Geofence has widely increasing scope day by day. A geo-fence can be generated as per user's need by a predefined set of boundaries. The technology used behind proactive Location-Based Services(LBS) are called Geo-fencing.

Location-based reminder, that reminds the user to do something when the user arrives at a particular location or leaves a specific location. Such as the college, home, office or any other address in the user's contact list. Using Geofencing, the location-based technique provides services to customers based on the knowledge of their locations. This access and process user's location with Global Positioning Systems (GPS) to obtain more information about the current location and notify the user about surrounding events. Cell phones now emulate computers, with enhanced graphical user interfaces, integrated Global Positioning Systems, wireless data connectivity, efficient batteries, powerful central processing units and expanded storage capabilities. As well, the Android Application Programming Interface(API) provides accuracy of location

IndexTerms–**Geospatial analysis, Global positioning system, Google Places API**

I. INTRODUCTION

Very few applications are functioning for location-based geo-warnings that are proposed to illuminate the portable or stationary customer proactive about area explicit data. In this concept of Geofencing, there is an examination of the innovation for inland portable route frameworks.A location-based reminder that reminds you to attempt and complete one issue once the customer makes, or leave, a particular area like user's work, user's home, or the contrary location in user's contacts list. The area based administrations are to create administrations to users bolstered the data of their areas [1]. Mobile phones presently emulate computers, with gathered user interface, coordinated global Positioning Systems, remote information property, conservative batteries, incredible Central Processing Units (CPU), and extended storage capacities.

The great urban areas advancement begins with system definition and town ace structuring. The initial step is to attempt an extreme appraisal of the city's trademark and statistic profile like training rate, wrongdoing rate, and contamination levels. This furthermore incorporates understanding the city's subject (mechanical, urban, IT, satellite, legacy), economy, exchange and history, current difficulties, torment zones, native profiling, government readiness, improvement openings, and existing set-up just as administrations. Despite the fact that this should be possible utilizing ordinary methodologies and systems, utilizing LBS and dissecting area information can empower city chairmen to play out an exact appraisal that is more explicit than generic[2]. Area might be an imperative component of an organized society. LBS blessing a productive chance for the local organization to fortify its execution by speculation area and subject knowledge. Right now, resident data and information, that are an advantage for driving enhancements in administrations and managerial execution, are to a great extent underutilized. It is basic for neighborhood specialists to ace effectively begin distinguishing client prerequisites and address them in a methodical way to convey progressively successful, directed and better administrations to residents and networks. LBS, whenever upheld in a very independent way, will be useful for administrators, organizations, and voters as they represent considerable authority in focusing on the right people at the right area and at the ideal time.

II. Related work:

Today, area based administrations (LBS) measure an imperative element of cell phones like cell phones or tablets. While thinking about the user's area, they are primarily used to empower the scan for area based data (for example encompassing shops, close-by companions, accessible rental cars)[3]. Along these lines, a LBS is being questioned and the pertinent data is being exhibited by a portable application just on solicitation by the client. In elective words, the mentioned area explicit data is being pulled by instead of being pushed to the client [4]. As of late, all real portable working frameworks presented assembling support for proactive LBS, otherwise called Geofencing[5]. For this situation, the cell phone can advise the client about area explicit data in the event that the client enters or leaves a devoted zone, called geofence. This element is mostly utilized by area based update applications as a helpful route for clients to be reminded about close to home to-dos at specific areas. Another horrendously encouraging application space manages area based commercials [3]. Cell phone clients that square measure strolling or driving on the purpose of a promotion locale square measure pondered to be potential clients and can be proactively informed with respect to deals or coupons. By and large, it is deficient to choose whether a client is a potential focus for proactive promotions or geo-warnings when all is said in done by simply checking the client's area as for a solitary geofence. For instance, a potential focus for area based promotions landing at a business region and originating from a rich region of the town may be more intrigued by extravagance vehicle offers than people on foot touching base with open transport from a poor locale. Taking the beginning of the client into thought moreover would chop down the arrangement of every potential focus for proactive extravagance car offers to a littler anyway pertinent set. Thus, no intrigued users would not be overflowed with geo-warnings that are not of any significance for them. Since the present geofencing executions are not ready to adapt to these extra spatiotemporal imperatives, we acquainted a technique with model another kind of geofence, named as geofence scenario[6]. A geofence circumstance incorporates a succession of geofences which require to be gone a conceivable focus in an exceedingly explicit request all together that an associated geo-notice gets activated at the cell phone. Given

the example higher than, a geofence situation would contain a solitary geofence enveloping the rich area, a solitary geofence including the business region and the fleeting connection between one another. More often than not, Geofencing is dead on cell phones exclusively. It incorporates the nonstop situating of the cell phone just as the consistent coordinating of the situation of the versatile with a lot of geofences. Lamentably, checking the client's area regarding a geofence situation requires more assets on the cell phone. These assets won't be realistic on telephones or their utilization would build the battery channel extensively, making it for all intents and purposes infeasible. Subsequently, this paper presents a substitution framework helped approach for Geofencing. In this manner, a slight portable customer is in charge of situating while the substantial weight procedure of observing geofence situations is executed inside the infrastructure[7]. The foundation is subsequently pondered to pursue the focal worldview of the portable cloud to help cell phones in their day by day work.

III. Literature Survey:

Child Safety & Tracking Management System implemented by using GPS, Android and Geo-Fencing, gives a solution to track missing child. This is done by implementing GPS and GSM technologies. There are two important factors to support child tracking mechanism are GPS and SMS. The location services are implemented with the help of GPS and telecom services with SMS.

This application has been designed to locate missing children. The arrangement spoke to in this paper takes the benefits of cell phones which offers rich highlights like GPS, SMS, Google maps Probably the best works upheld in the past rely upon SMS based for the most part trailing that is not valuable to actuate partner right area in the anticipated framework. Eventually Geo-fencing and crisis SMS helps to support the framework..

Dependable Geofencing Assisted Configuration of Proactive Location-based Services, this thought is to help geofence designer, is does not matter whether the user is expert or not, at the time of geofence connection process with an estimation on how the ideal arrangement will most probably influence the general dependability of a proactive LBS. For that reason, a perform is finished that approves a given geofence against fluctuated criteria to measure its pertinent character onto the apparent dependableness. These powerfully parametrized LBS can precisely get a colossal amount of applicant geofences from shifted sources, precedent is, ecological sensor readings [3] or driving timetables [4], and they have to decide for each construed geofence whether it adversely influences the unwavering quality of the proactive LBS, before approving it.

This work introduced a strategy to help specialists and nonexperts amid the setup of proactive LBS with harsh estimations of how a geofence under scrutiny will most likely effect the unwavering quality of a proactive LBS. A few ecological conditions together with the street and way organize, the nearby attributes of radio flags just as the natural parameters of a proactive LBS itself were distinguished to have partner impact onto the possibility of a proactive LBS to appropriately watch a client to be among a given geofence. As a proof of idea, a prototypical approval work for geofences was actualized as a web administration and assessed concerning whether the evaluated probabilities are great approximations of the unwavering quality. The web administration is of a reasonable use for shifted proactive LBS usage since the estimations square measure determined severally of the given structure and square measure so normally pertinent. Despite the fact that the prototypic net administration indicates reasonable estimations, there is still space left for upgrades. Other ecological conditions like traffic lights, repeating roads turned parking lots, the populace thickness or even the socioeconomics of an area may not just improve the estimations in the initial two cases anyway would conjointly change to figure a rating bolstered a ton of expounded depiction of the envisioned application situation, a model is focusing on youngsters. Instead of basically evaluating the geofences' effect on the dependableness, a future form of the new administration may likewise propose changed variants of a geofence's unadulterated science, introduction or area for an improved setup.

Area based request sending in a geo-fencing application with numerous suppliers, the goal of this idea is to show a component for sending demands that think about clients' present areas. An administration switch in a geo-fencing application with numerous suppliers should utilize this component. This idea likewise shows the usage of the instrument in an administration switch.

The engineering indicates that any solicitation from the versatile application to the administration switch ought to incorporate the area facilitate of the cell phone on which the application is running[8]. After getting a request, the administration switch figures out which supplier should serve the solicitation. This is finished by figuring whether the area facilitate is inside an enlisted geo-fencing region. Assuming this is the case, the supplier of that zone is the objective supplier. The administration switch then advances the solicitation to the objective specialist service provider. In the wake of handling the solicitation, the supplier sends a reaction back to the administration switch. At long last, the administration switch sends the reaction further to the portable application.

The administration switch ought to keep up a relationship between a client's versatile application and an objective specialist organization to make effective the solicitation sending process. This affiliation is set up when the client sends the principal demand from inside an enrolled geo-fencing territory. At the point when the client arrives that territory and enters another zone, the administration switch ought to recalculate the client's new area arrange to figure out which supplier should now serve demands from that client. This affiliation works as a storing mechanism.

IV. MOTIVATION

The great urban areas advancement begins with technique detailing and city ace turning out with. the initial step is to attempt an extreme appraisal of the city's trademark and statistic profile like training rate, wrongdoing rate, and contamination levels. This set up together incorporates understanding the city's topic (modern, urban, IT, satellite, legacy), economy, exchange and history, current difficulties, torment zones, subject recognizable proof, government planning, improvement openings, and existing set-up still as administrations. in this manner this may be done misuse ordinary methodologies and components, abuse LBS a bit of breaking down area data can change city directors to play out a right evaluation that is a great deal of explicit than conventional.

Area likely could be an extremely fundamental piece of an arranged society[9]. LBS blessing a moneymaking shot for the local organization to reinforce its execution by influence area and national knowledge. As of now, subject information and data, that unit partner quality for driving improvements in administrations and body execution, unit for the premier half underneath utilized. It is basic for local specialists to ace effectively start particular customer prerequisites and address them in a passing deliberate way to convey

simpler, directed and better administrations to voters and networks. LBS, whenever executed in a passing independent way, are typically helpful for administrators, organizations, and voters as they center around focusing on the ideal individuals at the best possible area and at the best possible time. These LBS experiences are generally utilized for making our urban communities higher for all the city partners alongside the administration, voters, and organizations.

V. SYSTEM ARCHITECTURE

Figure 1 shows the detailed flow of geo-fence. Location-based service is another key practicality that gets employed in good phone applications. It is normally joined with maps to enable average aptitude to the client concerning their area.

Geofencing assume its job furthermore the outcomes likewise demonstrates that it is extremely valuable. As a matter of first importance, the businessperson or retailer will join to the record and would set the ideal area on the guide. From that point forward, the client needs to line the span further. By tapping the "New tag", one would be provoked to set the ideal geofence. Label name would be created precisely with significance to the circumstance. Presently the time has come to characterize a particular message for the made geofence with the goal that when the client enters the area or leave the area they are been told. The message has bolstered the determination of the wholesaler either client needs to demonstrate the warning by getting into the geofence or leaving the geofence.
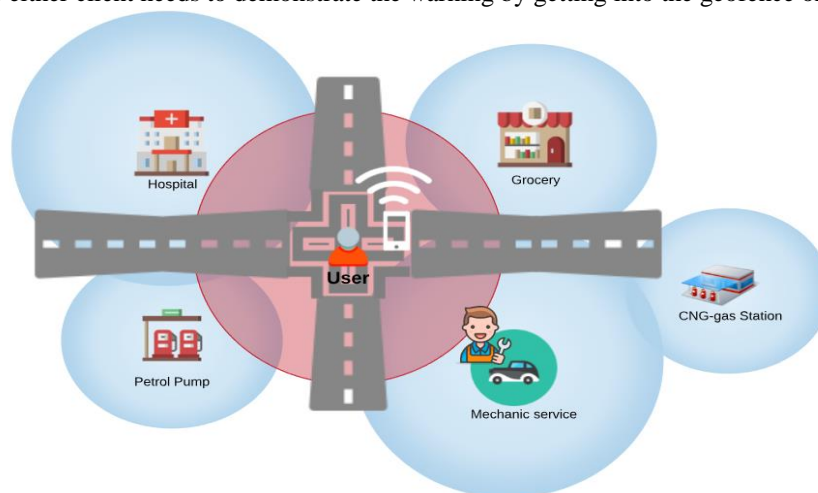

figure 1 Geo-fencing Overview

a. Android Location API:

These four classes in location API measures the various categories gift underneath the Location API package to retrieve the situation information of the user[10].

• LocationManager- the class gives access to the circumstance administration. It conjointly gives office to actuate the best Location provider according to the components.

• LocationProvider- It is a unique superclass type of area suppliers. An area provider gives intermittent reports on the geological area of the gadget.

• LocationListener- This class gives asking systems that square measure alluded to as once area gets altered. The perceiver article ought to be enlisted with the circumstance chief.

•   Criteria- the class gives the machine to settle on fitting Location provider by giving access to a line of required properties of the LocationProvider. Android conjointly give an API to get to the google maps. So with the help of the google maps and furthermore the area arthropod family, the machine will indicate required spots to the client on the guide.

b. Google Places API

On 10 May 2011, at the Google I/O Developer Conference in San Francisco, Google declared the opening up and general accessibility of the Google Places API[5]. The Google Places API is an administration that profits information about Places characterized inside this Web Service as, spatial areas, or favoured focal points utilizing HTTP demands. Spot reaction determines areas as scope/longitude facilitates. The four kinds of solicitations are accessible with the Google Places APIthere are four essential Place administrations accessible:

• Place Searches - It returns an array of nearby Places based on a location set by the user.

• Place Details - It returns progressively explicit information about a user characterized Place.

• Place Check-ins - It permits the solicitation that an individual has registered with a Place. Registration are utilized to measure a Place's fame; visit registration will help a Place's need in application's Place Search responses.

• Place Reports - It allows the users to add new locations to the Place service, and to delete Places that the application has added to the database[11].

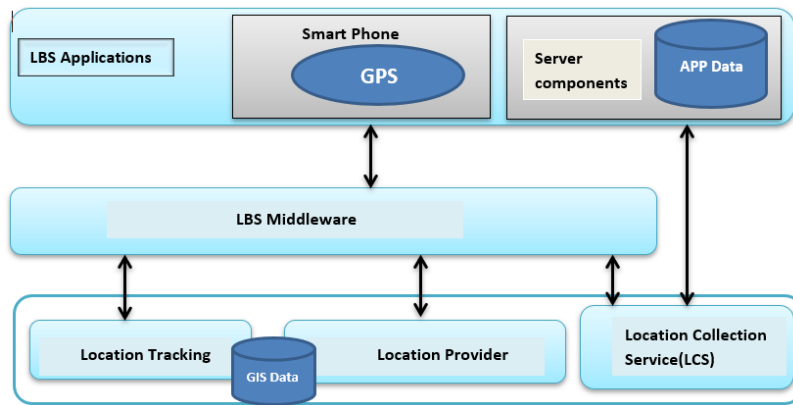Figure 2 depicts the overall architecture of Location Based System(LBS) using GPS technology.

figure 2SystemArchitecture

VI.   RESULTS AND DISCUSSION

As per the user expectations, viewing of nearby stores and task set can be represented as below.

-Figure3 shows the list of stores and list of offers or news related to the stores.

-Figure 4 contains the different stores on google map with its geofence. When any customer or user goes near to that fence then the user gets the notification for news or offer related to that store.

-Figure 5 shows the detailed description of any store which was available on database or nearby.
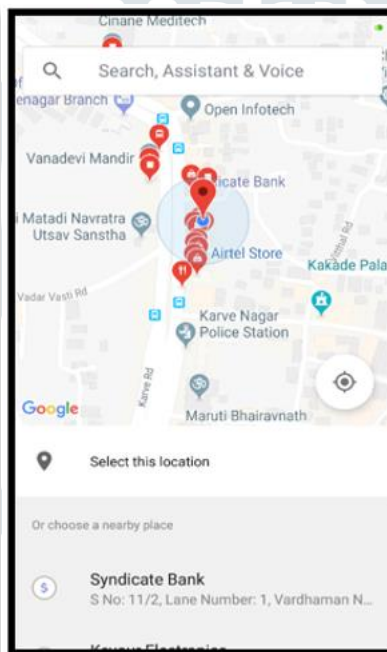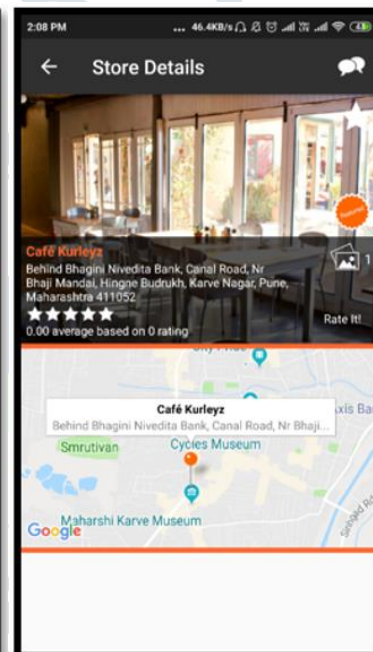

figure 3   *figure 4*   *figure 5*

-Figure 6 contains the user related task for the remainder. Means user going to add their task for the remainder when user or customer near to any store related to user task then user get the popup message or notification related to that.

-Figure 7 contains the task list which was added by customer or user for the remainder.
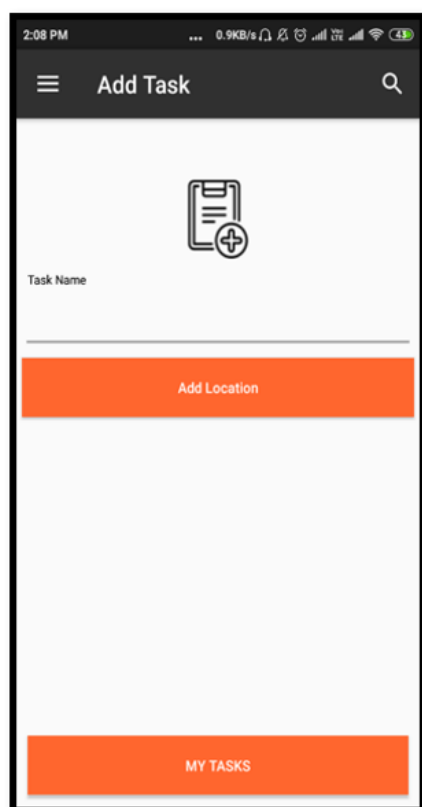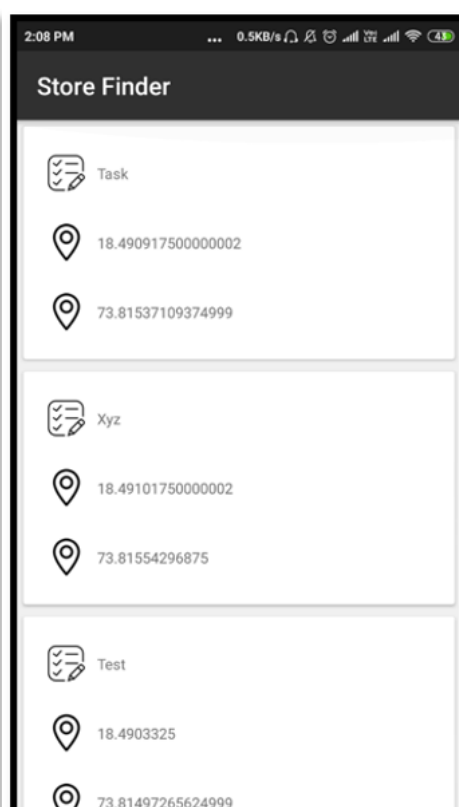
figure 6   figure 7

VII. CONCLUSION

Thus,here is a reliable system based on the geographic information system in android mobile. The user will be able to set reminders and get real-time notifications. For the selected geofences user may receive notifications upon entering or leaving the area. The main concept of this system is too valuable to Personal. As the ratings are given by other users, it will help to select the best of the available stores. By using this application, getting a personal reminder at a particular location is achieved.

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