GEOFENCING : NEXT LEVEL LOCATION TRACKING TECHNOLOGY

Nehal Chourasia[*1], Nihal Sargaiya[*2]

[*1,2]Computer Science & Engineering, Acropolis Institute of Technology & Research,

Indore, Madhya Pradesh, India.

ABSTRACT

Geofencing (geofencing) is an immensely useful and major feature of the software program, it uses global positioning system (GPS) or radio frequency identification (RFID) to define the characteristics of geographic boundaries. In fact, we can say that the geofence is a virtual barrier. Geofencing is an innovative technology, an online market that provides active contextual services, allowing users to easily find services of interest can easily subscribe and allow providers to provide services for various applications, such as electronic billing, contextual advertising Or a tourism information system, even without additional infrastructure. The main goal of this study is to understand how the use of spatial data can improve advertising effectiveness for clients. The tracking and monitoring system is based on global navigation satellite services, including geofencing functions, and can also contribute to the accurate location of organizations or companies, and effectively hike up sales and business prospects can now advertise on smartphones that have been inexpensively and accurately tested instead of large billboards.

Keywords: Geofencing, GPS, Geolocation, Geofence, Geotification, Geo-Tourist Guide, Location-Based Services.

I.   INTRODUCTION

The popularity of location-based services (LBS) has changed dramatically these days. The first generation of LBS has been of great interest in the last few years. Knowledge of the geographic location of mobile devices. Geographic information is used in many areas such as computer software and physical security. In this case, most of the existing technology uses GPS (Global Positioning System) to focus on pinpointing the user's exact position in an outdoor environment. Another view of location-aware computing would focus on the user's presence at the virtual boundary of a particular geographic landscape. The second alternative view is a supplement to the first view called geofencing, and it offers many advantages. A geofence refers to a geographic area of a virtual fence. According to almomani (2011). The concept has been used to perform a variety of tasks, including anti-theft and tracking of equipment, and automatic home surveillance systems. Social media also offers new ideas and use cases for location-based services, including geographic networks. We are also working on various technologies to improve the robustness and safety of these systems. The focus of these studies is to develop a geofence system of geofence applications of robbery management, house arrest, and accident management using Android smartphones. The goals include:

a) Develop an automated system that uses GPS technology to identify thefts in specific geo-fenced areas.

b) Analyse the importance of the geofencing system. Geofencing combines the knowledge of the user's current location with the knowledge of the proximity of the user to the location of possible interest. To mark a location of interest, specify its latitude and longitude. To adjust the proximity of the position, add a radius. Latitude, longitude, and radius define the geofence, creating a circular area around the location of interest, or nearby.

You can have multiple active geofences, limiting the number of users on each device to 100. You can request the location and exit event of each geofence to be sent, and you can specify how long you want to stay in the geofence area or wait before the trigger. Event. You can limit the duration of all geofences by specifying the validity period in milliseconds. Location services are automatically removed when the geofence expires.

II.   METHODOLOGY

A geofence is a virtual limit of a real geographic area. It can be a radius around the location or a set of predefined boundaries. Plot Research allows you to create geofences with a radius of 50 to 50,000 meters. The process of using geofencing is called geofencing. Geofences allow you to send notifications (for example) when users of your application are near a store. Geofencing is a virtual barrier program that allows an administrator to set a trigger to send a text message or email alert when a device enters or exits an administrator-defined limit.

Geofencing is a technology used to monitor moving objects (vehicles, people, containers, etc.) located by GPS. The geographic coordinates of the tracked object are as follows and are automatically sent to the control centre on a regular basis over the mobile network (Almomani, 2011). Historical and archaeological sites that guide visitors to the site in connection with the above studies can use the new geo-fencing.

Geofencing technology Geofencing has many features, including monitoring mobile assets and people in geographic areas, which can benefit in many areas. Various geo-fencing technologies have been developed to meet different real-world needs. The main technologies are as follows.
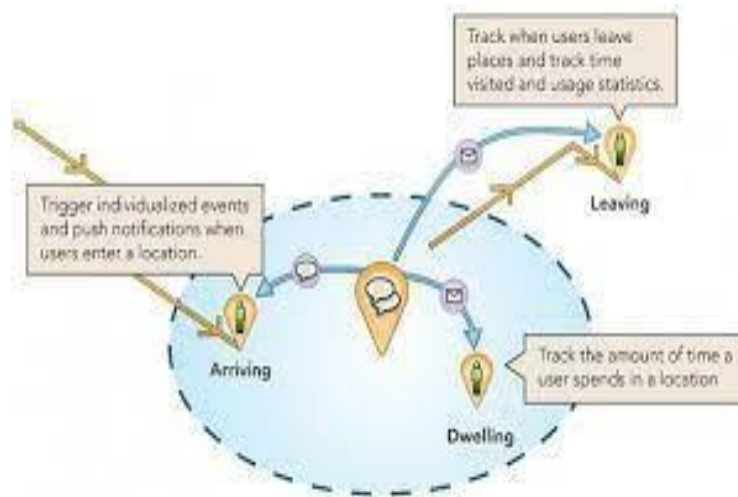
[1] Geofence Area

This technology provides automatic control of moving objects moving on or around the geofence area. An alert was issued when the cell phone entered and exited the border. The size of the area varies from tens of meters to several kilometres. The shape of the geofence can be a simple geometric figure such as a square or rectangle, or a complex shape such as a complex polygon.

[2] Proximity to a point of interest

This technology is designed to detect the proximity of a vehicle related to a point of interest (POI). In fact, the geofence is circles and the POI is in the centre. The radius is parameterized according to the distance considered "close" to the POI of, from a few meters to tens of kilometres. This method is the easiest way to implement geofencing as it only requires two parameters, the centre coordinate and the radius value. The algorithm calculates the distance between the moving object and the centre of the circle. Depending on whether this distance is less than or greater than the radius value, moving objects will be considered inside or outside the geofence, respectively.

[3] Route compliance

This technology involves monitoring moving objects throughout the journey from the starting point to the final destination. Geo-fencing can ensure that vehicles do not stray from their assigned route.

III.   RELATED WORKREVIEW

(Fabric et al, 2012) This research involves geofencing: an innovative technology based on telematics and satellite positioning. Geo-fence allows remote monitoring of geographic areas surrounded by virtual fences (geo-fences) and automatically detects when moving objects tracked by enter or leave these areas. The study introduced the basic concepts of geofencing and some applications based on this technology. Sturdevant Rick W. (2009) pointed out that Navtar Global Positioning System (GPS) is the first satellite navigation system, which allows users to accurately determine their position in three dimensions and time within one billionth of a second of, and from a concept to a fully functional system in just over twenty years. The most widely used GPS systems are the US-based GPS (Global Positioning System) and the Russian-based GLOSNASS (Global`naya Navigatsionnaya Sputnikowaya System) satellite positioning system. By 1972, the United States Air Force (USAF) and the United States Navy had been studying the possibility of improving satellite radio navigation for more than 4,444 years. The main reason for the development of GPS was the need to accurately target weapons and reverse the proliferation of the navigation system in the US Army. Petri (2015) noted in his research on the use of GPS to locate and track assets, "Accurate locating or tracking is required in many fields from navigating for rescuing wounded people in emergency situation to decision-making for striking the target during the military operations."

1. Recommendations for using geofencing with location APIs for Android

We can use the following techniques to optimize the power consumption of applications that use geofencing:

Set the responsiveness of notifications to a higher value. Doing so will increase the latency of 4,444 geofence alarms, thereby increasing power consumption. For example, if you set the response value to five minutes, your application only checks for incoming or outgoing alerts every five minutes. Setting a lower value does not necessarily mean that the user will be notified within that time period (for example, if a value of 5 seconds is set, it may take longer to receive the alert). For locations where users spend a lot of time (such as at home or work), use a larger geofence radius. Although a larger radio does not directly reduce power consumption, it does reduce the frequency at which applications check input or output, effectively reducing overall power consumption.

IV.   CONCLUSION

This article deals with the concept of geofencing. It introduces various applications used in the field of ground transportation, as well as the main control and monitoring technology based on geofencing.

Finally, future geofencing-based applications should benefit from satellite navigation services. It is expected that there will be great improvements in positioning accuracy, and by providing integrity mechanisms with higher mobile positioning accuracy and confidence, these systems will lead to More efficient geofencing applications.

V.   REFERENCES

[1]   Anthony.C. Ijeh, David .S. Preston, Chris .O. Imafidon, Titus .B. Watmon, Annette .O. Uwaechie, Aaron Nwadube, Ebrina Kujabi, Member, IAENG "Geofencing Components and Existing Models".

[2]   Anthony .C. Ijeh, David .S. Preston, Chris .O. Imafidon, Titus .B. Watmon, Annette .O. Uwaechie, Martin Cooke, Peter

[3]   Lancaster, Andy Widdess, Mojisola Soremekun, Member, IAENG "Geofencing Security Engineering".

[4]   Anthony .C. Ijeh, David .S. Preston, Chris .O. Imafidon, Titus .B. Watmon, Annette .O. Uwaechie, Samuel Ojeme, Benjamin .R.

[5]   Lucas, Member, IAENG "Geofencing Engineering Design and Methodology".

[6]   Aderonke Adegbenjo, Afonne Emmanuel, Department of Computer Science, Babcock University, Ilishan-Remo, Ogun State "Development of geofencing system for theft control management".

[7]   https://developer.android.com/training/location/geofencing.html.