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Android Based Advance Geofencing Application for Shopping

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ABSTRACT

Geo-fencing (geofencing) is a great feature in a software program that uses Global Positioning System (GPS) or radio frequency identification (RFID) to define the geographical boundaries feature. Actually geofence is a virtual barrier. Geofencing is an innovative technology, an online marketplace for proactive contextual services that allows users to easily find interesting services, can easily subscribe to it and to allow providers offer their services for a variety of applications such as electronic toll collection, contextual advertising or tourist information systems, even without additional infrastructure. The main objective of this research was to understand how the use of spatial data can improve advertising performance for customers. Tracking systems and monitoring, based on global navigation services by satellite, and include geofencing function, could also contribute to the exact location of an institution or company and increase sales and business perspective efficiently. Instead of large billboards they can now advertise on smartphones which is economically and accurately tested. Therefore, we have developed a concept for a market that offers geofence, which can be applied by all and increase the use and integration of proactive services based on location in everyday life.

KEYWORDS: Geofencing, GPS, Geolocation, Geofence, Gio-Tourist Guide

1. INTRODUCTION

The location-based services (LBS) have recently undergone a massive shift in popularity. While the first generation of LBS has not attracted much attention in recent years, the markets will create a wide range of LBS demanding second-generation applications, for example, in the areas of tourism information, navigation, asset tracking, mobile games and mobile marketing, to name just a few. Those above the LBS were under full control over the mobile network of the user operator. As a result, most of these principle LBS do not meet the requirements of users in terms of whether they are limited to rudimentary functions built with less creativity, or was use too expensive or both, see [1], [2]. This is in contrast to current LBS based on a value chain focused on the user where the position of the user is given by the GPSenabled mobile phone and transmitted to the respective service provider over the network 3G

data service either on request or an update- Strategy to meet the needs of users. The emergence of GPS receivers on the mobile devices has now made it much possible for the first time that proactive monitoringLBS's has permanently involved the user(s) with the option of just triggering an action of default position event execution. In many situations in our daily lives, proactive LBS's that are more affordable than the reactants, in which the user have to specifically request for the data based on the location. There are several types of GPS position location point events that can be tested. For example, if the user is in the vicinity of a point of interest(POI) or to user. In the recent past, the concept of geofencing, which represents a subset of LBSs, and which sometimes are also called Zone-based LBSs [3], is gaining momentum. Geofences helps in describing the geographic area (i.e., geographic barrier) a POI, for example, in terms of a circle or a polygon, and combine the area with location events and actions. Typical location events are entering and leaving the geographic region enclosed by the geofence or staying inside or outside for a certain amount of time.

2. Literature Survey

Geofencing Technology:

Explore literature on geofencing technology, its evolution, and applications in various domains.

Understand the existing geofencing techniques, algorithms, and best practices.

Mobile Application Development for Android:

Review literature on Android app development, particularly focusing on location-based services and integrating geofencing features.

Investigate frameworks and tools commonly used for Android app development in the context of geofencing.

Shopping Behavior and Technology Integration: Examine studies on consumer behavior in shopping, especially in the context of mobile applications.

Identify research on the integration of technology in shopping experiences and how it influences consumer decisions.

Advanced Features in Geofencing Applications: Investigate literature on advanced features that can be integrated into geofencing applications.Explore how technologies like augmented reality (AR) or machine learning can enhance the shopping experience.

User Experience and Interface Design:

Look into research on user experience (UX) and interface design for mobile applications.

Identify studies that discuss effective ways of presenting information and engaging users in shopping applications.

Privacy and Security Concerns:

Explore literature on privacy and security concerns related to location-based services and geofencing.

Understand the ethical considerations and legal aspects associated with tracking user locations.

Case Studies and Implementations:

Search for case studies or implementations of similar geofencing applications, especially those related to shopping.Analyze the successes and challenges faced by other projects in this domain.

Market Trends and Industry Reports:

Look for market trends and industry reports related to location-based shopping applications.

Identify key players and emerging technologies in the field.

3. Proposed System

A. Features

Geofencing creates a virtual geographical boundary that triggers a marketing action to a mobile device when a user enters or exits that boundary. An administrator or developer first establishes a virtual boundary around a certain location in GPS.

B. Scope

Geofencing can be utilized in a plethora of ways and the triggers can vary including: mobile push notifications. trigger text messages or alerts. send targeted advertisements across multiple digital channels including programmatic display.

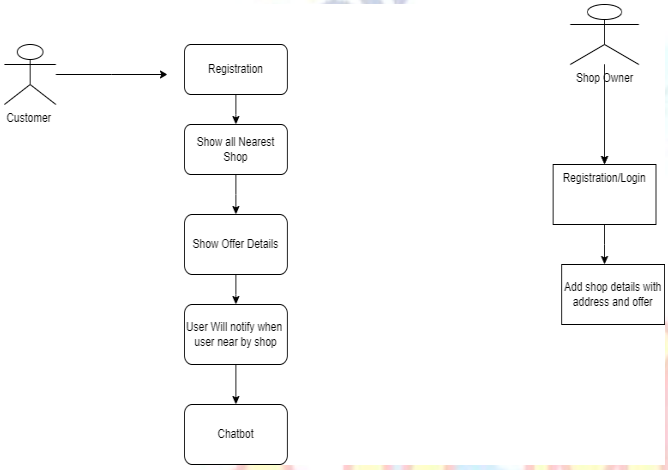
C. Methodology

Geofences are created through GPS location devices or other location-based service (LBS) software such as radio frequency identification (RFID). Moreover, the geofence or perimeter can be represented by a radius from a location or point, drive time from a location or point, census blocks, or custom-designed areas.

D. Objective

The ultimate objective of geofencing, meaning its primary use, is to provide value through mobile advertising. One of the best ways to do that is by sending messages that are immediately useful to consumers.WiFi and GPS are used to alert marketers when a mobile device enters the defined perimeter.

4. System Architecture



1.Figure: System Architecture

5. Implementation

Android is a mobile operating system based on a modified version of the Linux kernel and other open-source software, designed primarily for touchscreen mobile devices such as smartphones and tablets. Android is developed by a consortium of developers known as the Open Handset Alliance and commercially sponsored by Google. It was unveiled in November 2007, with the first commercial Android device launched in September 2008. It is free and open-source software; its source code is known as Android Open-Source Project (AOSP), which is primarily licensed under the Apache License. However most Android devices ship with additional proprietary software pre-installed, most notably Google Mobile Services (GMS) which includes core apps such as Google Chrome, the digital distribution platform Google Play and associated Google Play Services development platform. About 70 percent of Android smartphones run Google's ecosystem; competing Android ecosystems and forks include Fire OS (developed by Amazon) or Lineage OS. However the "Android" name and logo are trademarks of Google which impose standards to restrict "uncertified" devices outside their ecosystem to use Android branding. The source code has been used to develop variants of Android on a range of other electronics, such as game consoles, digital cameras, portable media players, PCs and others, each with a specialized user interface. Some well- known derivatives include Android TV for televisions and Wear OS for wearables, both developed by Google. Software packages on Android, which use the APK format, are generally distributed through proprietary application stores like Google Play Store, Samsung Galaxy Store, and Huawei App Gallery, or open-source platforms like Aptoide or F-Droid. Android has been the best-selling OS worldwide on smartphones since 2011 and on tablets since 2013. As of May 2017, it has over two billion monthly active users, the largest installed base of any operating system, and as of August 2020, the Google Play Store features over 3 million apps.[15] The current stable version is Android 11, released on September 8, 2020.

Module 1

Android Studio: Android Studio is the official[7] integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development.[8] It is available for download on Windows, macOS and Linux based operating systems or as a subscription-based service in 2020.[9][10] It is a replacement for the Eclipse Android Development Tools (E-ADT) as the primary IDE for native Android application development. Android Studio was announced on May 16, 2013 at the Google I/O conference. It was in early access preview stage starting from version 0.1 in May 2013, then entered beta stage starting from version 0.8 which was released in June 2014.[11] The first stable build was released in December 2014, starting from version 1.0.

Module 2

Firebase The Firebase Realtime Database is a cloud-hosted database in which data is stored as JSON. The data is synchronized in real-time to every connected client. All of our clients share one Realtime Database instances and automatically receive updates with the

newest data, when we build cross-platform applications with our iOS, and JavaScript SDKs. The Firebase Realtime Database is a NoSQL database from which we can store and sync the data between our users in real-time. It is a big JSON object which the developers can manage in real-time. By using a single API, the Firebase database provides the application with the current value of the data and updates to that data. Real-time syncing makes it easy for our users to access their data from any device, be it web or mobile. The Realtime database helps our users collaborate with one another. It ships with mobile and web SDKs, which allow us to build our app without the need for servers. When our users go offline, the Real-time Database SDKs use local cache on the device for serving and storing changes. The local data is automatically synchronized, when the device comes online.

6. Conclusion

The Android-based advanced geofencing application for shopping offers a transformative approach to enhancing the retail experience. By leveraging geofencing technology, this application creates a dynamic connection between users and stores, providing personalized notifications, offers, and relevant information based on their real-time location. The system's architecture, incorporating a mobile application, geofencing engine, backend server, and databases, establishes a robust framework for seamless communication and efficient management. This innovative solution not only enriches the shopping journey for consumers but also empowers store owners with valuable insights for targeted marketing and improved customer engagement. As mobile commerce continues to evolve, the integration of advanced geofencing capabilities opens doors to a more personalized, context-aware, and enjoyable shopping experience.

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Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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