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GeoPrompt: A Mobile Applications Reminder System Based on Location

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Abstract

In today's fast-paced environment, maintaining organization and order is more critical than ever. Traditional paper reminders, though useful, often fall short of meeting the efficiency demands of modern life. While mobile phone reminders are commonly used, they are typically time-based and cannot address tasks that require attention at specific locations. To address this gap, we present "GeoPrompt-A Mobile Application Reminder System Based on Location," a cutting-edge Android app that improves task management by utilizing Google Maps and GPS technology. GeoPrompt transforms how individuals manage their tasks by automatically associating them with specific locations. This location-based reminder system ensures that reminders are triggered only when users are present at the designated location, making it highly relevant and timely. By integrating Google Maps and GPS, GeoPrompt provides precise location awareness, ensuring that users receive reminders exactly where they are needed. The application caters to a wide range of scenarios, from reminding users to pick up groceries when near a store, to notifying them about work-related tasks upon arriving at the office. This functionality not only improves task management but also increases overall efficiency in our mobile-centric era. GeoPrompt's user-friendly interface and seamless integration with existing mobile technologies make it an indispensable tool for anyone looking to enhance their organizational skills. By utilizing state-of-the-art technology, GeoPrompt offers significant advancement over traditional and time-based reminder systems. It addresses the need for location-specific reminders; ensuring tasks are completed at the most appropriate time and place. In doing so, GeoPrompt exemplifies how modern technology can be harnessed to meet the evolving needs of users, ultimately leading to better productivity and task management in everyday life.

Keywords: Geofence, trigger, location-based services, GPS technology, location-based reminders

INTRODUCTION

We provide an overview of location-based services and stress the significance of context-aware reminders, emphasizing the vital role of mobile phones in their dissemination. Location-based services are becoming increasingly significant because they provide clients with services tailored to their present location. These services include mobile maps that adapt to the user's location to maximize data use, location-based advertisements, recommendations based on current traffic conditions, real-time traffic updates, and the ability to locate nearby businesses.

Current location-based systems have two significant disadvantages: they are rigid and do not use information well. These systems usually provide information at inappropriate times, disregarding user preferences and the dynamic

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nature of the situation. Although they are effective for tasks that must be completed in specific locations, they may not be able to manage.

Location-based reminders are helpful when it is unclear exactly when to arrive at a destination, such as when returning books to the library or stopping groceries on the way home. Customers can personalize these reminders to set up location-triggered reminders. We provide a user study on Place-It to show how vital location-based reminders are for customers, even during occasional failures.

The system under consideration is essential to users' daily lives as it ensures that they effectively manage their necessary activities by enabling task reminders at several locations. Unlike many other location-based service apps currently in use, our solution allows users to set many reminders at a single location, which increases organizational efficiency. Users can benefit from this functionality.

The most advanced applications are mobile devices that have specific purposes. They can be customized to run on various platforms. Mobile applications thrive in location-based services that notify users of particular facts based on where they are at that moment. Crucial activities are typically neglected by humans, resulting in incomplete actions. Although location-based services are helpful solutions, some applications do not work well because they use information inefficiently and do not consider the user's intention or current position while providing services.

This study aimed to offer a comprehensive understanding of how location-based reminders can be seamlessly incorporated into our daily lives.

LITERATURE SURVEY

During our search for relevant studies in this field, we reviewed several technical publications. We examined the apps offered to several app stores [1]. Our study reveals various applications that employ different approaches to solve connected issues, each with unique benefits and drawbacks. We intend to address these benefits and disadvantages when developing the proposed method.

Among its features, "Tick-Tick" is a task management app that offers location-based reminders among its features. Users can set a reminder tied to a specific location to receive notifications when they arrive at or leave the location [2].

"Bus Snooze" is an application that combines timer and location-based alarm functions. Its primary objective is to activate an alarm when the user reaches their location or establishes a time for themselves. A warning will sound if any of the two requirements are satisfied; otherwise, it will not. Although this MultiTrigger method is adaptable, it occasionally results in false alarms. This is particularly true if clients must reset their location because of delays, such as traffic [3]. There are only two locations where users of the program's free edition can set alarms. Users can program new alarms at various locations and activate them upon arrival. In addition, users can add, remove, enable, or turn off their arms. Remarkably, the quality of the upholds.

The "Notify@Location" app for iOS determines how far the user is from their destination based on their current position [4]. The drawback of the app is that it drains much battery life while running continuously in the background until the user reaches its destination. This straightforward software allows users to add and remove destinations.

Ghinita et al. described a novel technique for securing location-based alerts by leveraging the concept of searchable encryptions [5]. Two strategies, known as HVE (Homomorphic Value Evaluation), have been studied to enhance the efficiency of cryptographic algorithms when looking for encrypted

data. HVE, a crucial part of their private location alert system, safeguards encrypted data while adopting the user's.

"ComMotion" is a contemporary context-aware technology designed to simplify the use of location-based reminders. GPS technology allows users to set reminders for specific times and locations within predefined time windows. The system sounds alert when the user gets close to the predetermined spot in the allotted amount of time.

The company "CybreMinder" advanced these ideas by developing a reminder application built on the "Context Toolkit." This software uses contextual data, including location information, to trigger reminders efficiently [6]. One of the key goals was to make the development more accessible by eliminating hardware specifics and providing the tools required for developers to create a feature-rich reminder app. However, its utility is restricted, and the need for specialized sensing equipment has hindered its wider popularity.

"Notion" is a versatile productivity application that has gained popularity owing to its customizable features [7]. Although it is not specifically a location-based reminder app, it offers the ability to create custom databases and templates, allowing users to create their system for managing tasks and reminders, which can include location-based elements.

In their research effort, Joe MC and Raj JS developed a novel approach for a location-based orientation-dependent recommendation system [8]. This method leverages information from a smartphone's accelerometer and magnetic compass to generate a boundary box, unlike typical recommendation systems that rely on geo-coordinates. By accurately locating the phone and determining its orientation, it produces a recommendation system that is more cognizant of the context. The proposed approach aims to reduce ambiguity and enhance item extraction based on user orientation to improve the precision of the suggestion. Remarkably, this dynamic method lowers the processing costs while increasing the computing capability for more valuable recommendations.

PROPOSED SYSTEM

We are launching an app that simplifies the setting of location-based reminders for the users. It is an easy process: you select a location, and the software demarcates a zone of a specific size around it. When navigating and entering this designated zone on the map, the app alerts you to the tasks that you need to do.

This program allows users to set location-based reminders by defining a geofence around a given area [9]. The geofence comprises three essential components: the latitude and longitude coordinates of the location, and a predetermined radius around it. Users indicate where a reminder becomes active when they create it. Subsequently, the geofence was correctly configured. As users move and enter the geofence on the map, the reminder serves as an efficient means of reminding them of the task.

METHODOLOGY

Planning, designing, developing, testing, and evaluating the stages by applying an agile methodology to software development. Our project is split into five parts based on these stages: add and favorite alarm module, register alarm module, alarm trigger module, location module, and login module.

PROPOSED SYSTEM ARCHITECTURE

The architectural framework includes a detailed description of the operating flow of an application. Users must create a unique username and strong password to log in. It is possible that additional security measures, including email verification, will be part of the registration process. Users can log in to their credentials to utilize the functionality of the application [10].

When the user logs in, the program requests permission to access the device's GPS or other location services to determine their current location. Users must explicitly grant software access to their location data. The application is designed to handle many scenarios, such as users rejecting location access or location services being disabled.

After logging in and permitting location permission, users can locate an area on the map to construct a geofence.

User credentials, geofence data, and other private information were encrypted to maintain security. Furthermore, encryption techniques such as HTTPS protect every connection between the application and server [11].

A robust location-based reminder application can be made possible by comprehensive design, which describes the procedures for database management, location-based services, user authentication, and real-time processing, as shown in Figure 1.

MODULE DETAILS

Login

Users of the regular app can log in, which enables them to store and protect their data in the program's database. If they want to preserve their data, normal users can log into the program and securely store it for later use.

Add Favorites

Users can easily add and manage their preferred destinations using an intuitive module. Owing to this streamlined functionality, users can easily store and retrieve their selected locations, which makes the app more user-friendly.

Register Reminders

Permit the user to select the starting and stopping locations for reminders. This feature allows users to register specific websites as trigger destinations and link reminders to their chosen locations.

Alarm Trigger

When the application enters a predefined location range, it sounds alert, sends a notification, and shows a screen with relevant notes. The program alerts users to loud alarms and displays essential information along with an alarm stop button on the screen.

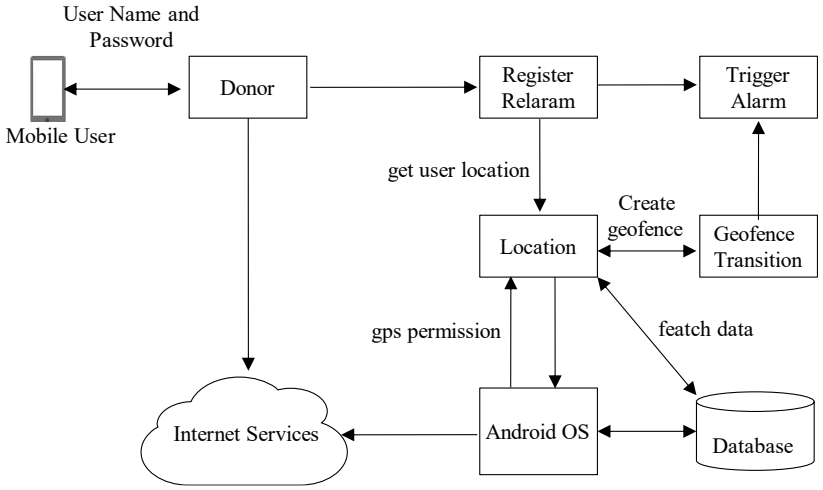

Figure 1. Proposed system architecture.

Location Module

This introductory module is at the heart of our application; its operation is necessary for the entire system to function. When the user gives permission, this module initiates a chain reaction for the related actions. A sequence of geofence transition events is initiated by detecting a favorable occurrence, that is, a catalyst. It is crucial to remember that if the user denies permission for this module, the software becomes inaccessible and unusable.

EXPERIMENTAL RESULT

To choose the location, tap the 'reminder location option to open the map and select the desired location, as shown in Figure 2.

After searching for the location, the result displays "Searched result" on Google Maps, as shown in Figure 3.

Figure 4 shows the location description, whereas Figure 5 illustrates the notification of the location reminders.

Figure 2. Reminder location.

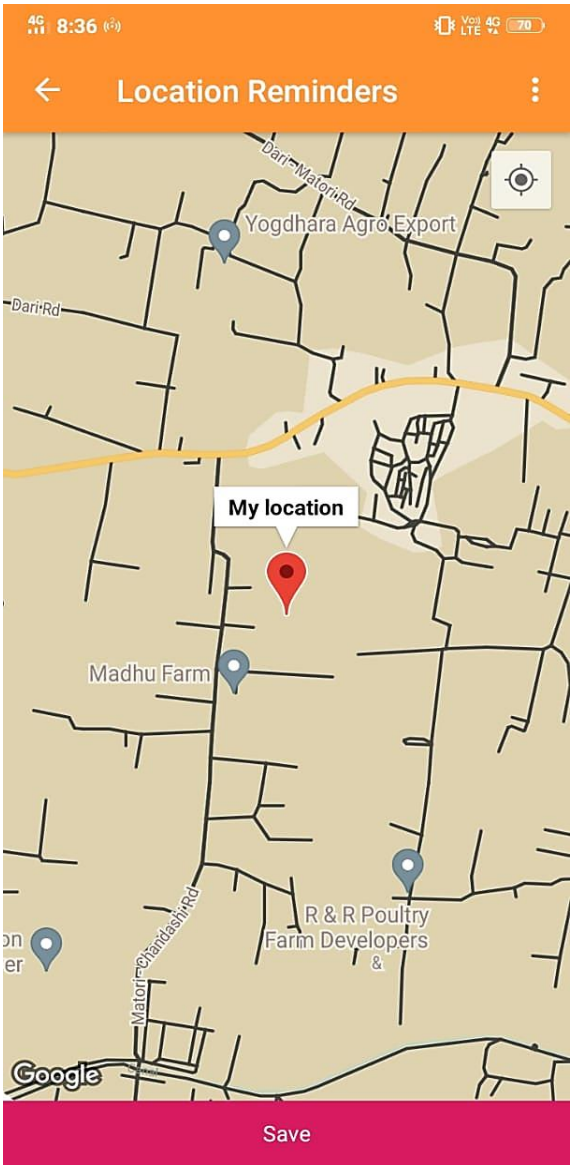

Figure 3. Searched location.

Figure 4. Set description of location.

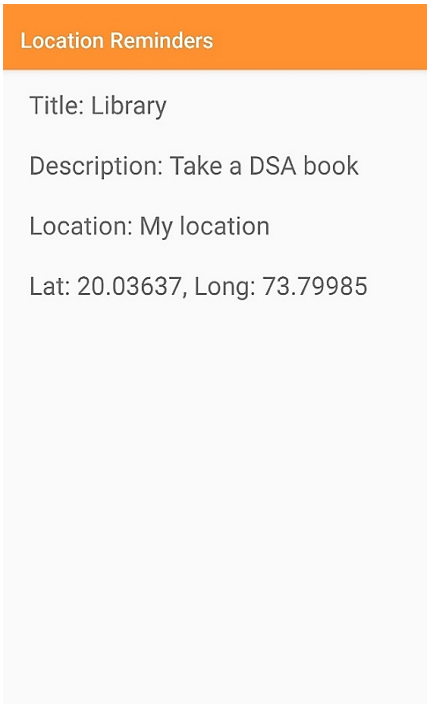

Figure 5. Notification about location reminders.

CONCLUSION

In summary, location-based reminder apps utilizing geofencing and GPS are useful tools. They assist you in remembering significant tasks and appointments by activating alerts when you are near specific locations. With the help of these apps, reminders can be effectively linked to specific locations, ensuring that crucial items are remembered when they are in an appropriate place. Tasks requiring organizations, such as food shopping and work-related responsibilities, can be effectively managed using these tools. They also support you in maintaining your routine and in enhancing your toolkit for productivity.

Future Scope

Location-based reminder apps appear to have a bright future, with exciting possibilities. These apps, such as intelligent geofencing, may become more precise and effective as location-tracking technology advances. Connecting these apps with wise gadgets and the Internet of Things (IoT) will likely deliver consumers with a smoother, more connected experience. Future reminders could be more personalized if they consider where you are and other factors, such as the weather and your daily routine. AR, or augmented reality, might be pretty hip in urban areas. We may also notice more customizable options and reminders you can share with others. Ensuring user privacy and considering regional variations are crucial. Future developments may potentially bring about eco-friendly methods and improve the comprehension of user behavior. With these enhancements, location-based reminder apps should become more sophisticated and user-friendly.

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