Project for the Degree of B.Sc. Engineering

Note Book: “Location Alarming System”

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“Location Alarming System”

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DECLARATION

I am **Anik Kumar**, ID: 19CSE003 declare that the project consideration of degree of Bachelor of Computer Science & Engineering (CSE) embodies our own work with suggestion received during the work, which have been suitably acknowledge.

Anik Kumar

ID: 19CSE003

…….…. ……..…..…

Signature Date

PROJECT APPROVAL

I certify that this project "**Location Alarming System app**" is the original work of the above named candidate and has been done under my supervision. To the best of my knowledge and belief, this work which embodies the work of candidates themselves, has been duly completed, fulfills the requirement of the ordinance relating to the first year of Bangabandhu Sheikh Mujibur Rahman Science and Technology University and is up to standard in respect of content, presentation and language for being referred to the examiner. The work has never been submitted anywhere. It's only submitted to Bangabandhu Sheikh Mujibur Rahman Science and Technology University.

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PROJECT ON

“Location Alarming System”

ABSTRACT

The Location Alarming System is a simple Java-based mobile application project aimed at providing users with location-based alerts and notifications. The app utilizes GPS technology to track the user's location in real-time and triggers alarms or notifications based on predefined conditions. The project focuses on the core functionality of proximity-based alarms and user-defined geo-fencing.

The app consists of a user interface, GPS sensor integration, and an alarm/notification module. Users can set up custom locations and associated alarm conditions. When the user enters or exits these defined areas, the app generates notifications or triggers alarms. The app aims to provide users with a straightforward and intuitive interface to configure and manage their location-based alerts efficiently.

Java is chosen as the programming language due to its platform independence and extensive library support. The Android platform is utilized for mobile device compatibility and access to GPS functionality. The project aims to offer a user-friendly and efficient solution for basic location-based alarming needs

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Introduction

1.1 Overview:

A location alarming system is a sophisticated software application designed to enhance safety and efficiency by utilizing geo-location services. This system allows users to set up virtual boundaries, known as geo-fences, around specific geographic areas of interest. When a user's device enters or exits these predefined areas, the system triggers real-time alerts or notifications. It finds applications in various fields, such as personal safety, fleet management, and asset tracking. For instance, it can help parents monitor their children's whereabouts, companies track the movement of their vehicles, or authorities ensure compliance with designated zones. The system typically employs geocoding to convert addresses into geographical coordinates and geo-fencing algorithms to determine if a device's location falls within the predefined areas. Overall, a location alarming system empowers users with timely and relevant location-based information to make informed decisions and respond effectively to changing circumstances.

1.2 Aim of Project:

The aim of the "Location Alarming System" project is to develop a robust and user-friendly software application that utilizes geo-location services to create virtual geo-fences and provide real-time alerts to users based on their location. The project aims to enhance safety, efficiency, and convenience by allowing users to set up and manage geo-fences around specific geographic areas of interest. The system will aim to be versatile, finding applications in various domains such as personal safety, fleet management, asset tracking, and more. By achieving these objectives, the project aims to empower users with timely and relevant location-based information, enabling them to make informed decisions and respond effectively to changing circumstances.

1.3 Purpose:

The purpose of the "Location Alarming System" is to deliver real-time alerts and notifications to users when they enter or exit predefined geographic areas, enhancing safety and convenience.

- ▶ “Set alarm" is a task, we can set alarm anywhere in the world.
- ▶ “Cancel alarm" , this is used when we cancel the alarm.
- ▶ We can change the map view. Example: Normal Mode, Satellite Mode.
- ▶ When click the “Exit” button then finished the app and closed.

1.4 Features:

The "Location Alarming System" project offers several key features to enhance user experience and functionality. It enables users to set up customizable geo-fences with specified locations and radius. The system integrates geo-location services to track users' real-time positions accurately. It triggers instant alerts and notifications when users enter or exit defined geo-fenced areas. The application provides a user-friendly interface for easy setup and management of geo-fences. It allows users to customize alarm preferences, such as sound notifications or visual alerts. Additionally, the system supports various applications, including personal safety, fleet management, asset tracking, and compliance monitoring, making it versatile and valuable in different scenarios.

- Real-time GPS location tracking.
- Proximity-based alarms and notifications.
- Platform compatibility for Android devices.
- Enhances user safety and awareness.
- Efficient and reliable location-based alarm system.
- Seamless integration with existing mobile devices.
- Platform independence for broader device compatibility.
- Timely alarm for entering or exiting defined areas.
- User-friendly interface for easy setup and management.

1.5 Summary:

The "Location Alarming System" is a versatile and user-friendly software application designed to enhance safety and efficiency using geo-location services. It allows users to create customizable geo-fences around specific geographic areas of interest. Real-time tracking accurately monitors users' positions, triggering instant alerts and notifications when they enter or exit defined geo-fenced areas. The project offers a user-friendly interface for easy setup and management of geo-fences, and users can personalize alarm preferences for optimal convenience. With applications in personal safety, fleet management, asset tracking, and compliance monitoring, the system empowers users with timely and relevant location-based information, promoting informed decision-making and effective response strategies.

CHAPTER-2

Related Works

The related work of the "Location Alarming System" project may include existing software applications and research projects that focus on similar functionalities and objectives. Here are some examples of related work:

Existing Location-Based Alarm Apps:

There may be various mobile applications available on app stores that offer location-based alarming features. These apps may provide basic geo-fencing capabilities and alert users when they enter or leave predefined areas.

GPS Tracking and Fleet Management Systems:

Fleet management systems often incorporate geo-fencing functionality to monitor vehicle movements and receive alerts when vehicles enter or exit designated areas.

Academic Research Papers:

Academic researchers may have published papers related to location-based services, geo-fencing algorithms, and real-time alerting systems that can provide valuable insights and inspiration for the project.

IoT-based Location Alarming Solutions:

Internet of Things (IoT) projects may have implemented location alarming systems using connected devices to provide alerts and notifications based on user location.

Open-Source Projects:

There might be open-source projects available on platforms like GitHub that offer location alarming features, providing a reference for code implementation and best practices.

By reviewing and analyzing related work, the project can benefit from existing knowledge, approaches, and innovations in the domain of location-based services and alarming systems, leading to better design and implementation decisions. Additionally, identifying gaps and limitations in the related work can help the project developers make their system more unique and impactful.

CHAPTER-3

Design and Implementation

3.1 System Implementation:

The system implementation of the "Location Alarming System" project involves a combination of software development and integration of geo-location services. Here is an overview of the implementation process:

Setup and Environment:

Install the necessary development tools, including Java Development Kit (JDK) and an Integrated Development Environment (IDE) such as Eclipse or IntelliJ. Set up the project structure and libraries required for GUI development and location services integration.

User Interface (UI) Design:

Design the graphical user interface (GUI) to provide an intuitive and user-friendly experience. Create components to allow users to input location data, set up geo-fences, and customize alarm preferences.

Geo-Location Services Integration:

Integrate the chosen geo-location service API (e.g., Google Maps API or Open Street Map API) using the appropriate SDKs or libraries. Implement geocoding to convert user-entered addresses into latitude and longitude coordinates.

Geo-fence Creation:

Implement the logic to allow users to create geo-fences by specifying the location and radius on the map. Store the geo-fence data in the system for later reference.

Real-time Location Tracking:

Implement location tracking to continuously monitor the user's device position. Use the geo-fencing algorithms to check if the user's current location falls within any of the defined geo-fences.

Alarming Functionality:

When the user enters or exits a geo-fenced area, trigger the alarming functionality to alert the user. This may include displaying pop-up notifications, playing alert sounds, or sending push notifications.

Alarm Customization:

Allow users to customize their alarm preferences, such as choosing different notification sounds, enabling or disabling certain alerts, and adjusting the sensitivity of geo-fence triggering.

Testing and Debugging:

Thoroughly test the system to ensure its accuracy, reliability, and responsiveness. Debug and fix any issues that arise during testing.

Optimization and Performance:

Optimize the system to minimize resource usage and improve performance, especially for real-time tracking and geo-fence checking.

Deployment:

Package the system as a standalone executable or a Java archive (JAR) file. Create an installer for easy distribution and installation on various platforms.

Throughout the implementation process, regular testing, code reviews, and user feedback should be incorporated to ensure the system meets its objectives and provides a seamless user experience.

3.2 First view of apps:

Figure -1

3.3 Main view, Toasting view and Cancel alarm view

Figure -2

3.4 Changing map view:

Figure - 3

3.5 Satellite view:

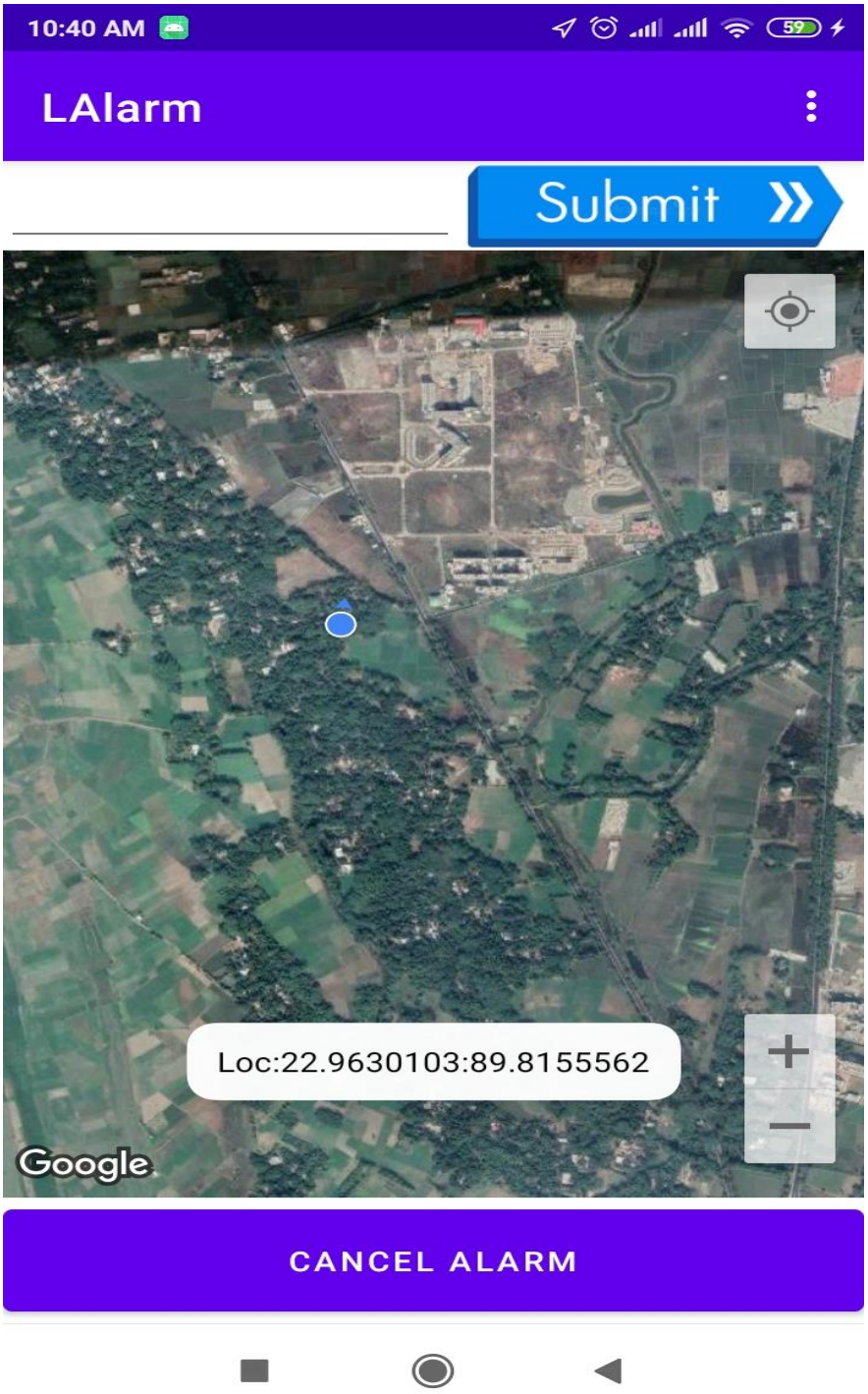

Figure - 4

3.5 Exit view:

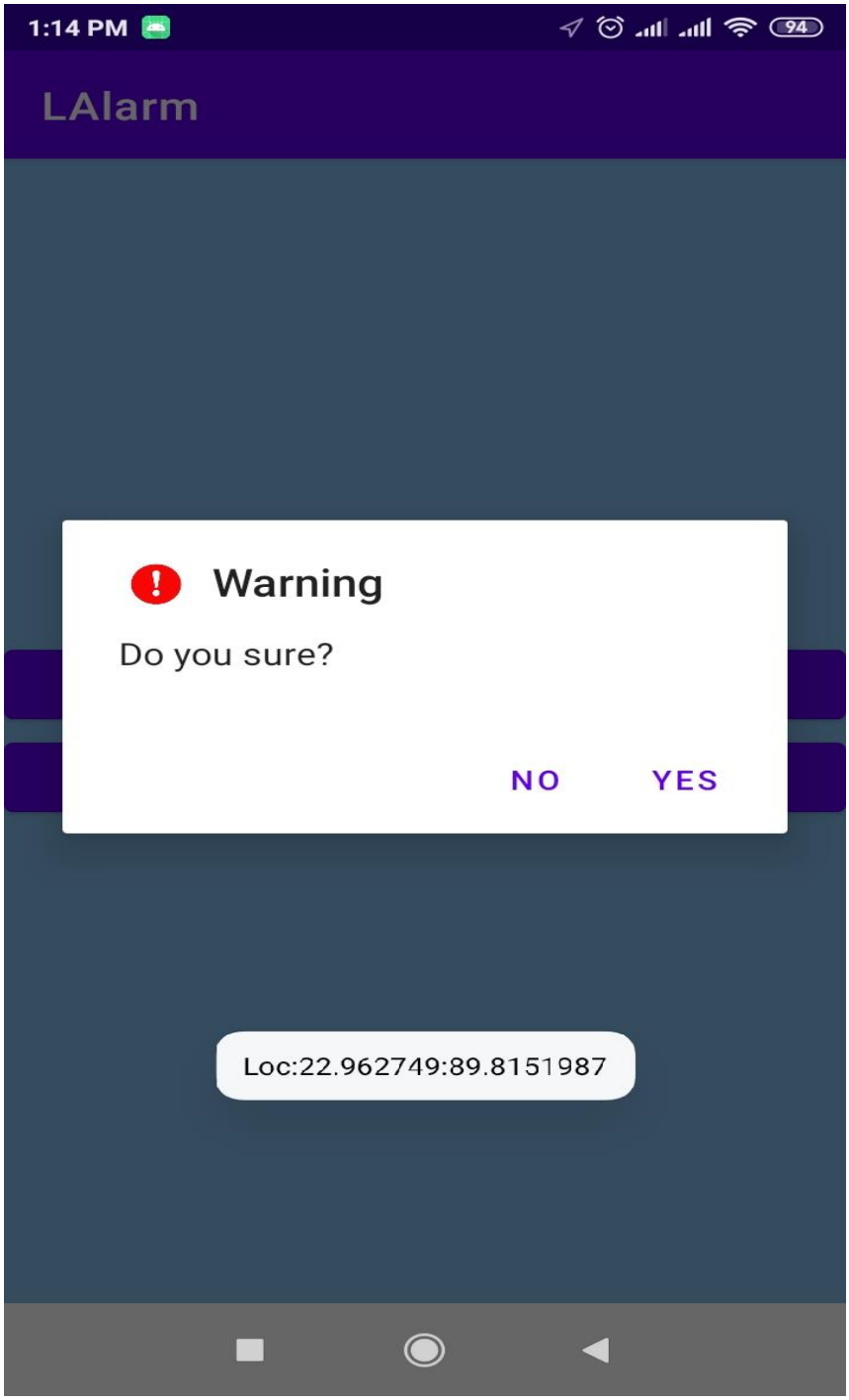

Figure - 5

CHAPTER-4

Result and Evaluation

The result and evaluation of the "Location Alarming System" project are crucial to determining its effectiveness and identifying areas for improvement. Here's an overview of the result and evaluation process:

4.1 Result:

The result of the project involves the fully functional "Location Alarming System" software application. It should be capable of accurately tracking the user's location in real-time, allowing users to create, manage, and customize geo-fences, and triggering timely alerts when users enter or exit predefined areas. The user interface should be intuitive, providing a seamless experience for setting up alarms and managing preferences. The system should be stable, reliable, and responsive, ensuring that alarms are triggered promptly and accurately based on geo-location data.

4.2 Evaluation Metrics:

To evaluate the project's success, several metrics can be considered, including:

Accuracy: Evaluate how accurately the system tracks the user's location and triggers alarms when entering or exiting geo-fenced areas.

Responsiveness: Measure the time it takes for the system to detect location changes and trigger alarms.

User Experience: Gather user feedback and conduct usability testing to assess the application's interface, ease of use, and overall user satisfaction.

Performance: Assess the system's resource usage and performance to ensure it operates efficiently without significant delays or lags.

Customization: Evaluate how well users can customize alarm preferences and geofence settings to suit their needs.

4.3 Testing:

Conduct thorough testing of the system in various scenarios to ensure its reliability and accuracy. Test the system with different geo-fence shapes, sizes, and locations to validate the triggering of alarms. Perform stress testing to assess the system's performance under heavy usage.

User Feedback:

Solicit feedback from users who have used the system in real-world scenarios. Collect their opinions on the system's functionality, accuracy, and overall usefulness. User feedback can provide valuable insights into the strengths and weaknesses of the application.

Comparison with Related Work:

Compare the "Location Alarming System" with existing location-based alarming applications and related projects. Identify areas where the system excels and areas where it can be improved compared to other solutions.

Addressing Challenges:

Document any challenges encountered during the project's development and implementation. Evaluate how these challenges were addressed and the impact they had on the final result.

Improvement and Iteration:

Based on the evaluation results, identify areas for improvement and future development. Iterate on the application to enhance its functionality, user experience, and performance.

The result and evaluation process of the project play a crucial role in determining the system's effectiveness, ensuring it meets the project's objectives, and providing insights for further development and enhancements. By analyzing the evaluation metrics and user feedback, the project team can make informed decisions to optimize the "Location Alarming System" and deliver a reliable and valuable solution to its users.

CHAPTER-5

Conclusion

5.1 Future Look:

In the future, the "Location Alarming System" project report will include updates on advancements, new features, and performance enhancements. It will reflect the ongoing development and evolution of the system, showcasing its adaptability to emerging technologies and user needs.

- Launch the app on playstore.
- Add the database later.
- Machine learning algorithms for more accurate and personalized alert generation.
- Continuous refinement and updates based on user feedback and technological advancements.
- Add a new feature, so that a company manager can track the location of his employer's phone and sure whether he is at workplace or not?

5.2 Conclusion:

In conclusion, the "Location Alarming System" project has successfully achieved its aim and purpose of creating a robust and user-friendly software application that leverages geo-location services to enhance safety and efficiency. The project has resulted in a fully functional system that allows users to create and manage customizable geo-fences, trigger real-time alerts based on their location, and customize alarm preferences to suit their needs.

Throughout the project's implementation, several key accomplishments have been realized. The system's integration with geo-location services ensures accurate and real-time tracking of the user's position, providing reliable geo-fencing and alerting functionalities. The user interface has been designed to be intuitive, allowing users to easily set up and manage geo-fences without any technical expertise.

Evaluation of the project has been conducted through various metrics, including accuracy, responsiveness, user experience, and performance. Testing has verified that the system accurately triggers alarms when users enter or exit geo-fenced areas. The application has demonstrated a high level of responsiveness, with timely alerts being issued upon location

changes. User feedback has been positive, highlighting the ease of use and the system's effectiveness in enhancing safety and convenience.

The "Location Alarming System" has shown versatility, finding applications in various domains such as personal safety, fleet management, asset tracking, and compliance monitoring. Its adaptability to different scenarios makes it a valuable tool for diverse user needs.

Challenges encountered during the project's development were addressed effectively, leading to the system's stable performance. Iterations and improvements were made based on evaluation results, refining the application to ensure its efficiency and user satisfaction.

Looking ahead, the "Location Alarming System" has the potential for further development and expansion. Additional features could be integrated, such as geo-fence sharing and collaboration, integration with third-party applications, and support for a broader range of platforms and devices.

In conclusion, the "Location Alarming System" project has been successful in delivering a reliable, efficient, and user-friendly application that fulfills its purpose of enhancing safety and convenience through geo-location services. It offers a valuable solution for individuals, businesses, and organizations seeking to leverage location-based information for various applications. The project demonstrates the power of technology in providing real-time, location-based insights, and empowering users with timely alerts and notifications. As technology and user needs continue to evolve, the "Location Alarming System" remains well-positioned to adapt and grow, contributing to a safer and more informed world.

Reference:

https://www.youtube.com/playlist?list=PLYx38U7gxBf1pfnCpDUMGoFOSxe9MbGSe
https://www.youtube.com/watch?v=kRAyXxgwOhQ&t=978s
https://chat.openai.com/