

Emergency Border Crossing Notification System for Fisherman Using AWS Cloud

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ABSTRACT: In the struggle for survival the fisherman transgresses the border which often ends being in custody or their death. This application is developed for the welfare of the fisherman to seek out the acceptable path to succeed in the terminals without crossing borders. In this application, we are using an android application and the AWS cloud. The main intention of the application is a full-time tracking using GPS tracker and to send various customized alerts as it reaches near or cross the border. The GPS tracker operates by tracing the signal waves from the cloud, then the accurate measurement of latitudes and longitudes is obtained, which gives the exact location of the boat. As it has a centralized admin portal in which the admin knows the boats which have crossed the border so the notification will be sent to the border security force which acts as the server to all or any other devices that are operated by people in ships. This application can be operated by any set of people.

KEYWORDS: Android application, GPS tracker, Google Maps, Mysql database, AWS cloud, Web application

I. INTRODUCTION

The whole system allows the user's mobility to be tracked using the android application which is used by the people in the boat. This android system which is in the boat helps to trace the GPS location and send it to AWS cloud where all the calculations are done and send it back to the mobile application which is installed in the android phone. As it has a centralized admin portal in which the admin knows the unique id of the boat which will be sent along with the latitude and longitude coordinates. MySQL is used for saving the live tracking of the boat's position in Mobile Object Database (MOD). The input data for the web application will be first passed on to an XML file by the Mobile Object Database. The web application is developed with PHP and apache server. Google Maps API is integrated into the web application which is ready to be in charge for showing this location on the portable device.

Android can be a contemporary mobile platform that's designed to be truly open source. Android applications can use advanced levels of hardware and software, furthermore as local and server data, exposed through the platform to bring innovation and value to consumers. Android platforms must have security mechanisms to substantiate security of user data, information, application and network. A well built and meticulous security architecture is needed for the security of Open source platforms. Android is with multi-layered security that has flexibility needed for an open platform, whereas providing protection for all users of the platform designed to a software stack, android includes a package, middleware and core application as a complete. Android powers many numerous mobile devices in additional than 190 countries around the world.

Android architecture remains as the basics for developers. The backend server is hosted in AWS Cloud. Security Controls are designed to attenuate the load on developers. Developers must simply work on versatile security controls. Developers aren't reception with securities that apply by defaults on application. Android is additionally designed to specialize in the user's perspective. Users can observe the working of the applications, and can manage the working. Most of the applications developed thus far use a handheld GPS receiver device for tracking true, but we've reduced the worth of the device by employing a portable which has an inbuilt GPS receiver. The system works by generating an

alert automatically when the boat crosses the borders. The system functions by using Global Positioning System (GPS) to obtain the details regarding longitudes and latitude which is used for continuous tracking of the boat. The system entirely uses the device based tracking which avoids failure within the system because of network problems.

II. RELATED WORK

Literatures on the previous ground work undertaken by the recognized scholars in this domain are discussed. Tendai Munyaradzi et al has set forward the most important challenges we face in cloud based security. The paper has Cloud based security solution for android. In the paper the various aspects of the cloud security is mentioned and is considered as the important and secure platform. In this an application is used which sends an alert to the device for taking sudden action if an hindrance or any unusual action is detected. In this application firewall is implemented to block the unwanted network traffic and a web interface which helps in visualization and collection of data which act as the solution for the security information.

The Android software package is recommended as a best tool for designing context aware applications. Towards the top, the author had featured an analysis report on performance of varied mobile devices for location aware computing. Technological development in an exponential manner have paved how to access hardware directly by customized application interface like GPS, web service, programming cameras were elucidated. Ubiquitous Computing is an emerging technology and has a lot of challenges in design, modelling and user interaction which are identified and implemented during this organizer application. Several techniques and methods are applied effectively to observe employee attendance.

Bandra.U, et al solved the matter by proposing a wireless attendance management system where iris of a personal is employed for authentication. It is also like a fingerprint where no two people can have the identical eyes. Once the eyes are scanned it is directly logged to the person profile. Unlike fingerprints, iris is more preserved from the external environment. But both the fingerprint and iris recognition based approach needs some extra devices or scanner which might be connected to the server computation system.

Vignesh S et al the paper titles as “ Providing a border alert system for fishermen by using GPS & GSM technology in wireless sensor networks” uses GPS to locate the position of the boat. A GPS route device may be a device that precisely discovers natural area by getting data from GPS satellites. This device can detect the GPS data every time the fishermen cross the Indian border. It's a major depression issue and encourages trouble within both people and also their economic expenditure.

III. METHODOLOGY

The system works by generating an alert automatically when the boat crosses the borders. The fisherman installs the application in the android system and then the system is tracked using the unique id given by the administrator during registration. The system records all the issues like weather conditions and external issues and then sent to the server, which is monitored by the authority within the border ranges and also sends them to all the devices coming under that range. The data is passed from mobile to web and vice versa via a windows server. This application can be operated by any set of people at their affordable rates.

The android application has MOD which is used to retrieve information from satellites and transmits through the server. The alert system starts giving notification when the user is nearing the border line. The activities of the application is that the person's position is saved in MOD (Mobile Object Database). For live tracking of the device MySQL is used. It functions as at first data is transferred into XML file from MOD and these inputs are given to Web application developed using PHP and apache server, integrated with Google Maps API. The Android app includes interfaces like user registration, location retrieval, tracking, destination distance, feedback and alert box and then the alert will be an SMS or Call Alert to the user's mobile. The system consists of several phases such as:

1. Mobile Object Database (MOD)

The mobile devices store and share data over a mobile network, or a database which is actually stored by the mobile device. This helps to download the information from the information repository and operate on it when there is no

signal coverage. A cache could be maintained to hold recently accessed data so that they are not lost due to connection failure. Mobile computing devices tend to have limited battery life and slower CPUs.

2. Working of Mobile GPS.

Mobile phones with GPS recipients communicate with almost thirty global positioning satellites within the GPS system. The built-in recipient trilaterates the current position using data from at least three GPS satellites and the recipient. Global Positioning System can calculate the current position of the user by carrying out calculations based on the crossing points of the overlapping spheres calculated by the satellite and the device with the GPS recipient. So by using trilateration the exact location of the device in the ground can be determined.

3. Registration and Login

For the new user the application is first installed in the android system and the registration process will be done and the user can install this into the device. This will help to keep track of actions that are occurring in the location that could be detected by the user. This guarantees the security credentials which helps to resolve the issues that take place. Since the registration process is done by the authority the authenticity is maintained. If a user is registered successfully once then the user can login in to the system anytime the user needs using the login credentials.

4. Location Retrieval

The destination to where the user needs to reach will be plotted and the direction to the terminal will also be provided with the help of Google Maps API to the user. For this the user needs to provide the current location to the device. This action allows the user to discover the accurate path to reach the destination. This option is activated by giving the current longitude and latitude points. After obtaining the point the appropriate path is found and the device will be tracked.

5. GPS Tracking

This action is used to find where the device is presently located. This ensures travel safety to the fishermen. This will also give periodic updates to the security forces and to the concerned authority about the devices which are being used in certain ranges. The GPS tracker in the device is used to provide details of the boat to the server. The system manages the user with the current details of the boat to all authority under surveillance.

6. Distance to be reached

The remaining distances to reach the destination will be provided by the tracker at every minute and the details will be provided to the server. This helps the security surveillance to know the complete details regarding the location of the fishermen. Once the source point and the destination point is specified the path to the location along with the distance will be specified by the system to the user. To find the distance between the pair of latitudes and longitudes Vincenty's Algorithm is used. In this the AWS cloud features are used when the latitude and longitudes are determined by the GPS it is sent to the cloud server and the further actions occur within the cloud server and the result is sent back to the android system as messages.

7. Feedback and Alert Dialog with border Area

This action provides the details regarding the present situation of the device and the cause to which the trouble has been generated. In the case of any discrepancies this action will help in notifying the authority and the user as messages for taking the necessary actions. The device is tracked on the basis of the details fetched from the cloud server and not based on the network that is used. The surveillance force and the server are being informed with the details regarding the location of the boat. If any unexpected attack occurs the alert will be sent to the authority so that the necessary actions can be taken for the security of the fisherman.

IV. EXPERIMENTAL RESULTS

Figure 1 shows the flowchart of the application , Figure 2 shows the death rate of the fisherman from 2000 to 2020

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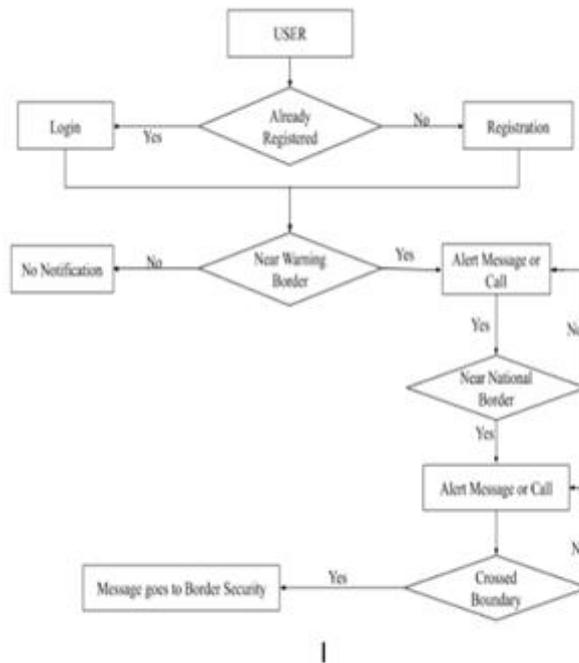


Figure 1 : Flow chart

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Death Rate of Fisherman

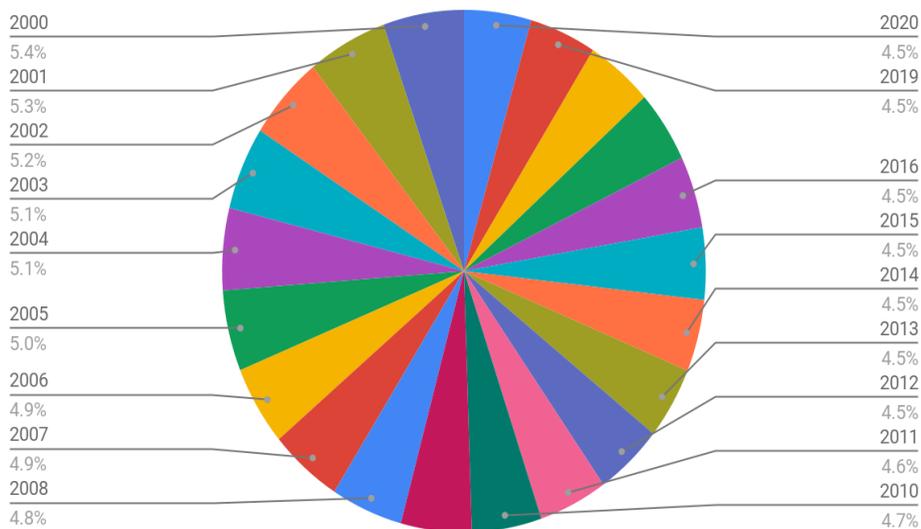


Figure 2 : Death rate of Fisherman

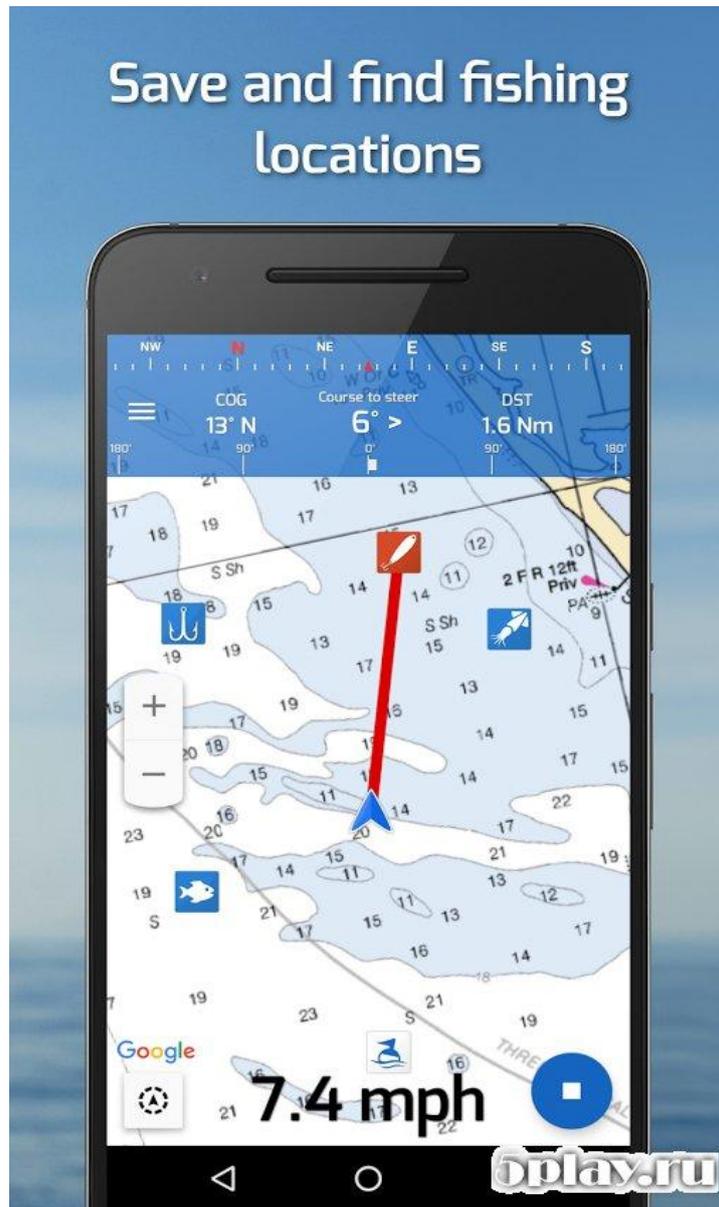


Figure 3: GPS tracker

Few advantages of the system includes that the android mobile phone is affordable to all. It costs less when compared to kit. Ease of use even by illiterate people and no overhead of device maintenance.

V. CONCLUSION

This paper aims to develop an efficient solution for sustaining the fisherman's community by hindering fishermen from crossing the unmarked country border. This application will be an evolution for verification of coastal border. This will also help the fisherman and the coast guards to take appropriate action if the border is crossed. In the future this can be enhanced by deploying the existing system in the boat by integrating with LoRaWAN.

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