FISHERMEN GUIDANCE APP FOR TRACKING MARI-TIME ACTIVITIES

¹ K . Emily Esther Rani, ² G. Samuel, ³A. ThangaSelvan, ⁴S. Navin Jayhar

₁,Faculty, ₂,₃,₄,Student

¹Computer Science and Engineering,
¹Jayaraj Annapackiam CSI College of Engineering, Nazareth, India

Abstract - Sri Lanka and India seaside nations are isolated by their sea borders. In Tamil Nadu about 20,000 vessels make spinning in the Bay of Bengal. The main aim is to give a well equitable user friendly environment for Indian Fisherman to handle hazardous situation with the help of engine control. This paper comes with a consistent solution for this problem and protects the Indian fisherman from dangerous situation and being crossing the maritime boundary and save their life and improve the safety of fisherman. The system is designed by using GPS and GSM. A GPS route device is a device that precisely discovers natural area by getting data from GPS satellites. This device can track the GPS data every single time at whatever point the fisher man's cross the Indian border. It is a significant depression issue and encourages trouble in the both people and also their economic expenditures.

Keywords - Security, Privacy, GPS, Compass, Emergancy Purpose

I. INTRODUCTION

Global Positioning system (GPS) provides a wide range of navigation and timing services. With the combined relocked usage of the GSM technology, it can be used for border security, tracking of boats and ships in the oceans and in the seas. The current issue of Indian fishermen of being abducted by the Srilankan navy is of serious concern. This paper serves as a benefit for these people where a DGPS system is attached to the boat which in turn is connected to an alarm device. The DGPS receives the topographic location of the boat in the sea and then triggers an alarm if the border of the country is crossed by the boat. Topographic location of a country's border can be obtained with the information of the latitude and longitude of the place and position of the boat. The borders of each country are defined in two levels. The first level extends till a certain distance in the sea and it is called as the National border of the country. Succeeding the national borders and just a few kilometers towards is the International borders.

The additional advantage from the existing border alert systems that are already imparted is that, the interlock of the GSM where minute by minute position of the boat can be received through an SMS to the family members from the control room through the use of DGPS. But, earlier systems employed infrared radiations which proved to be quite disadvantageous and difficult to use. The DGPS report is also sent to the control room from which the location of the boat can be tracked, in case it is lost in the seas. The paper uses a GPS device, GSM, microcontrollers and an alarm system to alert the fishermen whenever the border is crossed by unauthorized means. The number of fisherman abducted by the Srilankan navy scenario is shown below: The existing system is a low cost maritime border crossing alert system mainly focused on the small scale fisherman who lives just near to the poverty line. This system includes data collection unit, processing unit, controlling unit and transmission unit. The data collection unit consists of location detection components like transmitter and other components attached in the boat that accomplishes the vessel localization by collecting the geographical positions. The processing unit holds the set of latitude and longitude values of the sea in the form of databases that can be used for comparing the present boat position with legal border limits. The controlling un in the sea shore (remote station) from where the decision has been made if the vessel crossed the maritime border. All the communication among these three units is handled by transmission unit.

II. LITERATURE SURVEY

Arunvijay and Yuvaraj (2014) proposed a design for a border alert system to enhance the safety of fishermen. Their system utilizes Global Positioning System (GPS) technology to track the location of fishing vessels. The GPS receiver acquires signals from satellites and transmits the corresponding latitude and longitude data to a microcontroller unit. This unit compares the received location data with predefined border coordinates. If the system detects that the vessel is approaching or has crossed the border, an alarm is triggered. Additionally, a message is sent through a GSM module, likely to the coast guard or relevant authorities, informing them of the situation. This design offers benefits for both fishermen and coast guards by providing timely warnings to prevent accidental border crossings and enabling faster response in case of emergencies.

Ranjith et al. address the dangers faced by fishermen who unintentionally cross maritime borders. Their proposed solution is an automatic border alert system that leverages both GPS and GSM technology. The system utilizes GPS to pinpoint the location of the fishing boat and compares it to pre-programmed border coordinates. If the vessel nears or crosses the border, an alert is sounded on the boat itself. Additionally, the GSM component can transmit a message, potentially to the coast guard, notifying them of the situation. This system goes beyond just border safety; the authors explore the possibility of using it to detect natural hazards and receive weather information, promoting overall safe navigation for fishermen.

Sivaramaganesh et al. (2014) presented a study on the implementation of a maritime border alert system in the International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering. Their research likely explores the technical aspects of designing and building such a system. Further investigation into the paper would be necessary to understand the specific technologies employed and the functionalities of the proposed system.

Mulla et al. (2016) describe a border alert system designed to aid fishermen in the World Journal of Research and Review. This system utilizes GPS to track the location of fishing boats. The GPS receiver transmits latitude and longitude data to a microcontroller, which compares it to predefined border coordinates. If the boat enters a designated "warning zone" approaching the border, an alert is displayed on an LCD screen onboard. This informs fishermen of their proximity to the border and allows them to course-correct to avoid unintentional crossings. The system offers a simple and clear notification method to enhance navigational awareness for fishermen.

Varghese et al. (2022) presented an Arduino-based maritime border alert system for fishermen at the 2022 International Conference on Inventive Computation Technologies (ICICT). Their system leverages the affordability and ease of use of Arduino microcontrollers. Similar to previous studies, it employs GPS to track the vessel's location. The GPS data is fed into the Arduino, which compares it against pre-programmed border markers. Upon detecting a breach or close proximity to the border, the system triggers an alarm on the boat itself. It's likely the system offers additional functionalities, but details on these would require a deeper dive into the referenced conference proceedings.

Balakrishnan et al.(2017) examine various border alert systems designed to safeguard fishermen. Their focus isn't on a single system but rather on providing a broader overview of the technologies employed in these systems. The authors likely discuss the use of GPS for location tracking, microcontrollers for data processing and alert generation, and GSM modules for sending notifications to authorities. This survey would be a valuable resource to understand the general trends and advancements in border alert system development for fishermen.

III. METHODOLOGY

This chapter provides a technical overview of the key technologies and tools used in the implementation of fishermen application. It covers Dart programming language, Flutter with android studio, GPS communication, and MySQL database.

The main problem in the fishing rights in the Palk Bay is that of the conflict between the laws of the sea and traditional fishing rights. Sometimes, the death of penalty and imprisonment of the Tamil Nadu fishermen, supposedly by the Sri Lankan Navy, becomes an emotive right to life and livelihood (human rights) issue in the domestic politics of maritime boundary between India and Srilanka. Defense is a key factor to enable safe navigation in fishing in sea. Hence, National defense are addressed in terms of marine safety, maritime security, lifesaving, law enforcement, maritime environmental security and fisheries by Indian coastal guard. Thus, the target of proposed system is designed here to foster the coast guard officials to effectively monitor the fishermen and encourage the fisherman to explore inside our sea nation border by using smart boat vessel.

The modules description is below explained

- **ADMIN MODULE**

– **CREATE BORDER LOCATION DETAILS**

Administrator has the permission to add the border details such as latitude and longitude of the location. The design is a border alert system to safeguard the fisherman from being caught by other countries in coastal area. Global System for Mobile communication and Wireless Networks can be the best choice for addressing the maritime border crossing issue. In case to prevent further movement it reduces the speed and completely stops the motor of the boats. The information is maintained on the movement and location of the fishermen.

– **MANAGE BORDER DETAILS**

This module is used to view the border details which is already entered by the administrator. As because of the major threatening issue it leads to loss in the both humans as well as their economic incomes. The border system uses the Location of the fishermen to alert when they reach the border or try to cross the border. The system further reduces the speed and completely stops the motor if in case they try to cross the Border. Future avenues of work include implementing the system on a hardware platform and testing it with real life scenarios.

- **USER MODULE**

– **REGISTER**

The fisher man can register their details such as mobile number, name using register module. The user will perform either login or registration operation. After these operations get over he will go to the next phase. The module allows the new user to register and open the application to the browser which helps to monitor the actions that are happening in the border that could be traced by the officer and user.

- **LOGIN**

After successful registration, they can enter into the application by providing their mobile number as username. The security credentials are maintained so the issues that occur can be easily resolved. The registration can also be done by means of personal id also which is highly useful for illiterate people which can be directly used by the user or officer by just typing their id in that text fields.

– **PREDICTION**

- **COMPASS DIRECTION**

- This module is used to calculate the direction of the location as east, west, north, south using GPS.

- **WEATHER PREDICTION**

- This module deals with weather report of the specified location. This weather prediction contains humidity, temperature, and cloud information. The method used by Indian Meteorological Department (IMD) common end users is based on behavior pattern. Currently we have marine radios to forecast equipment. Weather channel INCOIS and also for next few days. Most standard features like daily, hourly forecast and additional information like safety weather for onboard fishing. It is easy to determine the feeding of all types of fishes. Solunar Time helps to plan the best time for fishing. weather forecast applications for the fishermen to predict the weather for onboard fishing 8% 4% 2% C. Mercy Amrita and P. Karthickumar the fishing spots. Fishermen needs to know about the here mobile application in English but these application of weather forecasting for observing weather conditions data of last few decades and its the weather and safety broadcast the accurate weather condition presently Mobile Application on weather condition helps us to find the Fishing and Hunting unar The following table specifies the 19%, 12%, 3%, 15% ,17% , 10%Facebook Messaging Youtube Entertainment Gaming Utilities Productivity News Others Internet browsing e requirements.

- **BORDER ALERT**

- **LOCATION INFORMATION**

- This module is used to track the current location details such as latitude and longitude. This module will check this location details against database border details using euclidean distance. The application can be widely used by people in the border to find the appropriate path to reach the destination. The notification will be sent to the border security forces which act as the server to all other devices that are operated by people in ships. The application will notify the information of where the devices are being located and intimate them about the issues that occur due to opponent forces in ships to server. This is processed mainly for Tamil fishermen's who are involved in fishing. The application uses the Global Positioning System (GPS) to provide the latitude and longitude information and its being used for tracking devices. The system entirely uses the device based tracking which avoids failure in the system due to network problems. The tracking here totally depends on the device and not on the signal/network that is currently used.

- *LOCATION BASED SERVICES USING ANDROID*
- Initially mobile phones were developed only for voice communication but now days the scenario has changed, voice communication is just one aspect of a mobile phone. There are other aspects which are major focus of interest. Two such major factors are web browser and GPS services. Both of these functionalities are already implemented but are only in the hands of manufacturers not in the hands of users because of proprietary issues, the system does not allow the user to access the mobile hardware directly. But now, after the release of android based open source mobile phone a user can access the hardware directly and design customized native applications to develop Web and GPS enabled services and can program the other

hardware components like camera etc. In this paper we will discuss the facilities available in android platform for implementing LBS services (geo- services).

• **ALARM**

• This module is used to make the alarm sound if the location meets the distance thresold. Thus the fishermen can easily identify the national sea borders and therefore prevents them from entering their area. The system provides high accuracy and high precision values of the Latitude and Longitude. This model proves to challenge the already existing model which just uses a GPS. A distributed system that offers remote monitoring of on-road vehicle location and diagnostics using an OBSB with GPS/GPRS is described. This system which can be pre-programmed with the permitted speed limits, offers a highly reliable and accurate supervision from inside the vehicle. This may effectively minimize the over-speed violations which are categorized as one of the major causes of accidents in many countries. Furthermore, the system also transmits the real-time position and other critical parameters of the vehicle to the remote server. The transmitted parameters which are saved on the server memory for a configurable period of time, can serve many purposes such as the vehicle path tracking of stolen cars, automatic accident notification, accident investigations and remote diagnostics of engine functions. A workable system prototype has been developed and its performance is assessed experimentally. The on-road experiments demonstrate robustness and high efficiency of the proposed system.

• **Importance of Mobile Application in fishing**

• Mobile application is the premier resource for fishing enthusiasts. Whether an amateur or a professional, fishing with mobile application provides the ultimate combination of tools to enhance the fishing experience and expand the connection to the world of fishing. Anywhere in the world a person can logon to the mobile application for effective fishing. Mobile Application gives valuable angling tools such as solunar, tidel charts, Advanced weather reporting, including radar maps, forecast and incident reporting, GPS Advanced Tracking, Catches Log Book, Sea depth, potential fishing zones, e.t.c. The following mobile Application are combined with characteristics useful for fishing. All the essential characteristics are grouped into one as a unique mobile application helpful for fishermen. Due to space consumption in mobile phones a single and customized application is beneficial for fishermen in effective fishing.

IV.SYSTEM ARCHITECTURE

The architecture design depicts the a overall flow of this project which contains administrator module and user module. the administration module contains the border details such as latitude and longitude of the border is maintained by the administrator. the user that is fisher man module contains the compass details that is direction of the boat is obtained. the fisher man can view the weather details and when he reaches the border this system gives alert notification to the fisher man.
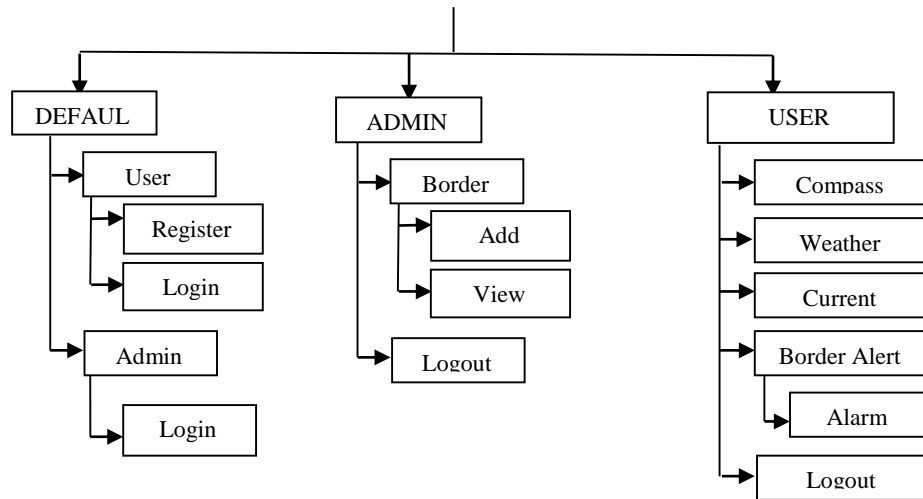
FISHER MAN APP

Fig.1 Architecture

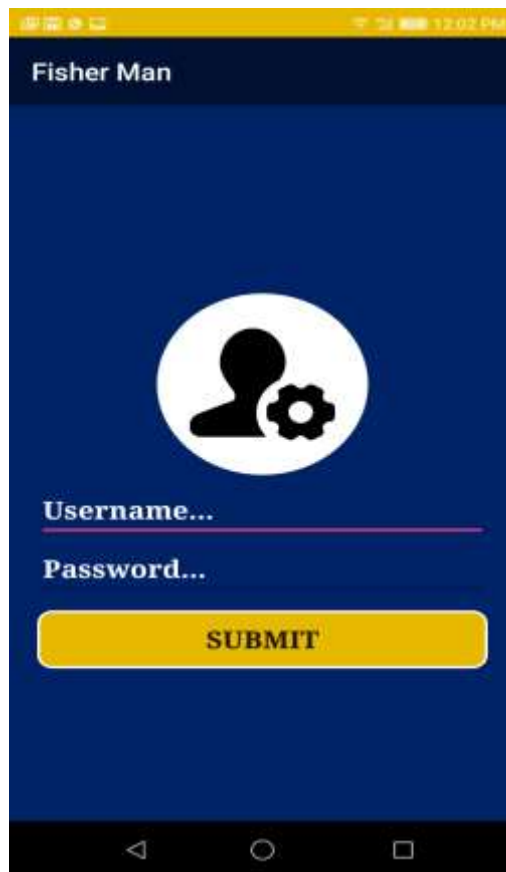Following Figures are the samples for the Project
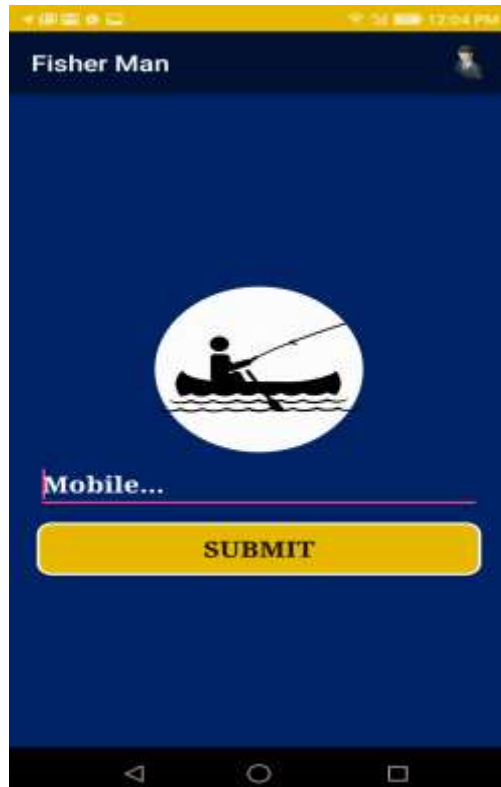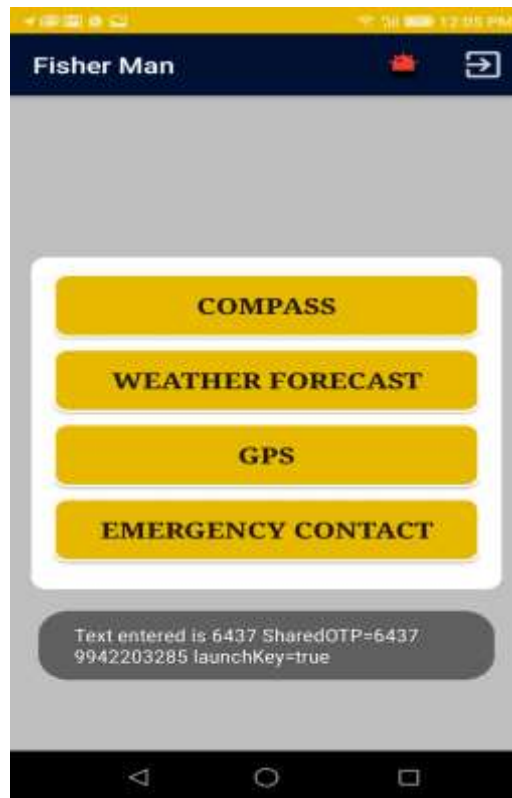

Fig.1 Admin login

Fig 2.User login

Fig.3.Home menu

VII. CONCLUSION

This proposal outlines a mobile application designed to enhance the safety of Indian fishermen. The system leverages GPS technology to track the location of fishing vessels and potentially integrates with other communication technologies for improved data transmission. This real-time data could be used to alert fishermen when approaching maritime borders, potentially reducing

the risk of unintentional crossings. An Android application is proposed as the user interface, offering features that could aid navigation and improve situational awareness.

The passage also suggests potential future advancements. These include:

• Enhanced Navigation: Incorporating GPS tracking and navigation functionalities within the app could significantly improve navigation, especially in unfamiliar waters. Features like waypoints, route planning, and real-time tracking would be valuable additions.

• Integration with IoT Devices: Seamless integration with Internet of Things (IoT) devices like smart buoys, fish finders, and environmental sensors could provide real-time data on water conditions, fish activity, and other relevant metrics.

• Fishing Hotspot Information: The app could be enhanced by featuring known fishing hotspots or areas with high concentrations of specific fish species. This data could be crowdsourced from fishermen themselves or obtained from marine biologists and fisheries departments.

• By implementing these suggestions, the proposed system has the potential to become a comprehensive solution for improving fisherman safety and overall fishing efficiency.

REFERENCES

Arunvijay, D., & Yuvaraj, E. (2014). Design of border alert system for fishermen using GPS. International Journal of Students Research in Technology & Management, 2(02), 67-70.

Ranjith, S., Shreyas, K., Kumar, P., & Karthik, R. (2017). Automatic border alert system for fishermen using GPS and GSM techniques. Indonesian Journal of Electrical Engineering and Computer Science, 7(1), 84-89.

Sivaramaganesh, M., Ramya, M., Gowtham, V., Bharathi, T., Jeevitha, G., & Scholar, P. G. (2014). Implementation of maritime border alert system. International journal of innovative research in electrical, electronics, instrumentation and control engineering, 2(3), 2321-5526.

Mulla, A. I., Sushanth, K. J., Prashanth Kumar, H. R., & Shameez, A. (2016). Border alert system for fishermen using gps system. World Journal of Research and Review (WJRR), 2(5).

Varghese, L. J., Sakthivel, A., Kirthic, J. S., Sharan, S., & Pavithra, R. S. (2022, July). Arduino based Maritime Border Alert System for Fisherman. In 2022 International Conference on Inventive Computation Technologies (ICICT) (pp. 533-538). IEEE.

Balakrishnan, N., Reshmi, S., Arunkumar, R., & Pradeepraj, M. S. (2017). A survey on border alert systems for fishermen. Pakistan Journal of Biotechnology, 14(4), 829-831.