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FISHERMEN BORDER ALERT SYSTEM USING IOT

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Abstract: The current marine security challenge includes protecting fishermen and responding to illegal border infiltration. Using the Internet of Things (IoT), this study created a technique for enhancing border detection that largely leverages the Automatic Detection System (AIS) to determine the boundary for fishermen. Very High Frequency (VHF) communication, inspired by X-band radar, is integrated into the proposed idea to provide highly accurate boat detection in the middle of the sea. The system can recognize and track vessels at sea. The system architecture included VHF (Very High Frequency) communication, which was modeled after the X band radar system, to provide the middle sea with a high level of boat detection and monitoring. The breadth of AIS.

The suggested approach uses Very High Frequency (VHF) communication, which was influenced by X-band radar, to give highly accurate boat detection in the middle of the sea. Boats at sea can be detected and tracked by the system. Inspired by the X band radar system, the system architecture integrated VHF (Very High Frequency) transmission to give the middle sea a high level of boat detection and surveillance. VHF transmission was used to extend the AIS's range. Using IoT devices, fishing boats provide position and status data to the coastal monitoring stations. Fishing boats equipped with IoT-enabled devices are part of the new AIS technology. After sending data, the IoT devices installed aboard boats transmit information to the coastal monitoring station. In addition to the introduction of the Internet of Things (IoT), the Automatic Identification System (AIS) currently in use has been improved. As a result, the system can now communicate with marine vessels and track and monitor them in a far more thorough and real-time manner.

Keywords: GPS, maritime border, proximity warning, geo-fencing, GSM, microcontroller, latitude/longitude, boundary line, safety zone, danger zone, distress signal, weather alerts, IoT (Internet of Things), proximity warning, fishing vessel, and coastal security.

I. INTRODUCTION

The primary source of livelihood for people living in coastal areas throughout the globe is fishing. However, crossing borders while engaging in fishing can lead to severe punishment. Uninformed fishermen risk crossing the border unknowingly, being arrested or killed by foreign naval troops, and losing their vessels. This endangers the lives of fishermen and has become a major cause of death and economic loss among coastal communities. In order to address this issue, a plan was formulated for raising fishermen's awareness of proximity to sea borders. Fisherman's Border Alert System GPS is among the gadgets that utilize the Global Positioning System (GPS) and the Global System for Mobile Communication (GSM) to alert fishermen of their country's borders. By warning fishermen as they are approaching the border line, the Border Alert System for Fishermen using GPS has the capability to change coastal towns. This reduces the risks associated with border violations and prevents cases of fishermen unknowingly crossing maritime borders. By implementing this system, fishermen will no longer have to be concerned about crossing borders and can focus on their work and means of livelihood. A crucial step towards increasing the safety and security of fishermen and coastal communities globally is the establishment of the Border Alert System for Fishermen Using GPS.

II. LITERATURE REVIEW

created a cutting-edge border alert system that works with both GPS and GSM technology. By using GPS to detect the fishing vessel, this device notifies fishermen when it gets close to the maritime limit. The device also uses GSM connectivity to send the boat's location to the closest seacoast office. Upon approaching the barrier, the boat sends a meddler to the Engine Control Unit, which employs an electronic energy injector to control the machine's speed. This low-cost naval device watches and alerts fishermen to illegal activities like invasion and smuggling before they happen.

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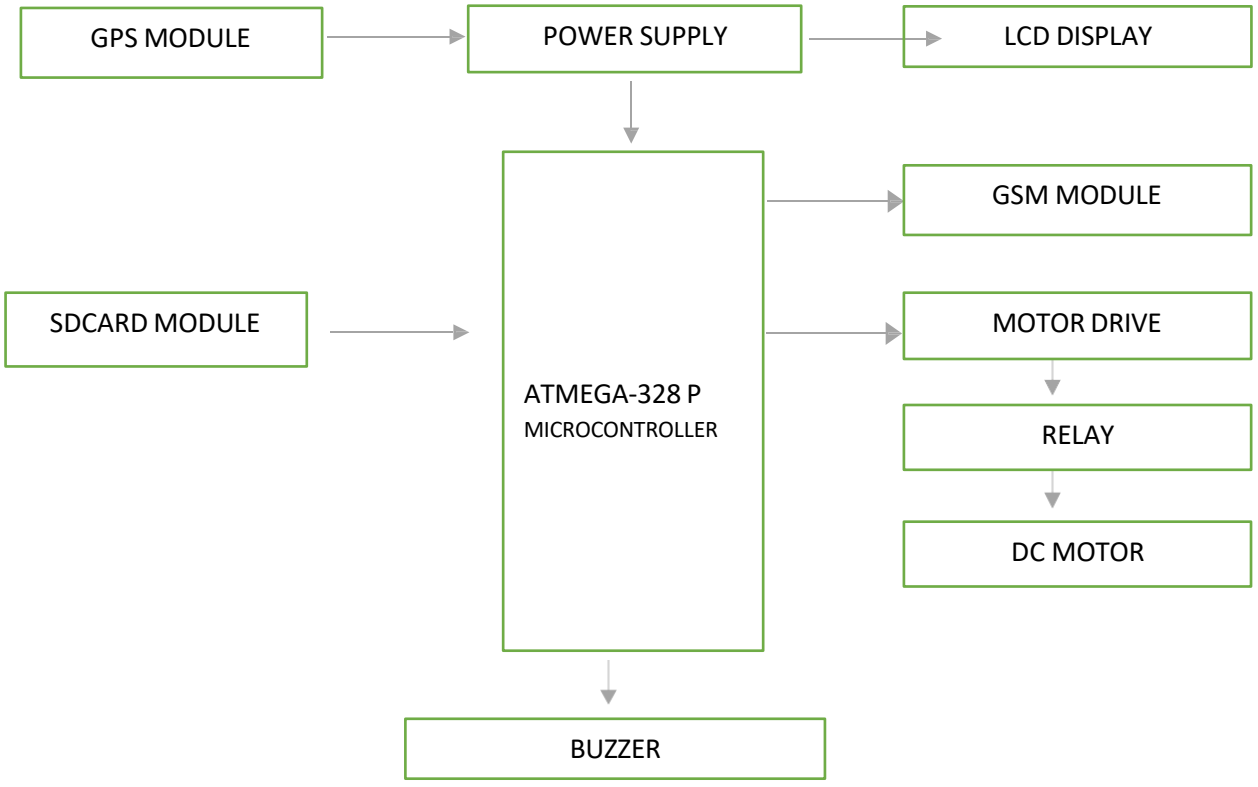
In order to determine whether or not the boat has crossed the border, the system gathers data from satellites and saves border locations. Nonetheless, the tar is recommended, and RF transmissions in the VHF (30–300 MHz) range are used to communicate with the nearby seacoast office. if the boat goes over the line. developed another border alert and smart shadowing system that makes use of GSM and DGPS. When the boat approaches or crosses the border, this device employs DGPS to track its position and triggers an alarm that includes a piezo buzzer. To guarantee the safety of their family members, the DGPS data is also sent to a control office and shared with the family on a regular basis. Using GPS and other technologies, various studies have created border alert systems for fishermen to protect them and prevent the loss of life and financial harm brought on by illegal conditioning. Seacoast services and control centers can take prompt action because of the real-time information these devices provide, in addition to warning fishermen.

III. OBJECTIVE

The objective of enhancing fishermen's safety with a border alerting system is to provide timely notifications that help prevent fishermen from entering hazardous waters or violating maritime borders. By offering real-time alerts, the system can reduce the likelihood of accidents, injuries, or fatalities by guiding fishermen to stay within safe zones. By providing real-time alerts, a border alerting system seeks to increase fishermen's safety by preventing them from inadvertently entering restricted or hazardous waters.

IV. RESEARCH METHODOLOGY

Often, the GPS unit will send out a signal that tells the latitude and longitude and the boat's position, which is shown on the LCD. GPS continuously and continuously offers users positioning, navigation, and timing services day and night. The maritime position is stored using GPS. The latitude and longitudinal degree of the boat's location are ascertained by comparing its present position with its previous maritime restricted position. The boat's LCD display will automatically display a warning message whenever it approaches the restricted area. A GSM modem is being used to send the warning messages. A GPS receiver and GSM modem are serially interfaced to a microcontroller.



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The engine automatically turns off through a relay and informs the coast guard when the fisherman disregards the warning and crosses into the forbidden zone. Towers are observed in coastal control offices, as they cannot be installed in the middle of the water. The coastal area, therefore, continuously receives GPS data from the GPS address. The primary aim of this GSM system is to provide uninterrupted boat monitoring and communication with the coastal office. The GSM module delivers the message to the concerned authority person when the boat crosses the border using the stored message beside the compared position.

V. EXISTING SYSYTEM

The systems are RADAR and GPS-based, which were driven over by coastal guards. Other systems are like the Android app, WSN-based (RSSI). But the above systems are impossible because of their short range, high price, time efficiency, etc. The biggest drawback of this current system is that they never gave an accurate method to control

the outboard motor speed used by our shared fishermen. All of these faults are addressed in our proposed work. For identification purposes, the fishermen are employing the GPS72h, navigation equipment used at sea. It gives the mariners the quickest and most precise means of navigating, determining speed, and determining position. The system allows higher levels of safety and efficiency. It guarantees whether the ship arrives.

to its destination in a safe manner. The precise position information is all the more important as the ship leaves or enters port. The GPS72h system has proven to be essential for the fishermen in ensuring accurate navigation at sea. By using this equipment, they can effectively determine their speed and position and ensure a safe journey to and from port.

VI. PROPOSED SYSTEM

The system under proposal is utilized to mark the boundary for the fishermen and to prevent the boats from encroaching into the border. It is achieved by the GPS which gets a signal from the satellite and provides the present location of the boat. The Arduino processor is coded to match the present longitudes and longitudes with the saved longitudes and longitudes of the SDCARD border. The specific layer level, i.e., border, can be predefined, and that can be saved in memory. The present value is matched with predefined values, and if these values are identical, then immediately the specific operation will be executed. The microcontroller provides a command to the buzzer to alarm. It also employs a message transmitter.to give a message to the base station, which keeps track of the boats in the sea. Every boat is assigned a special number by which A record of how many boats is tracked in the control station. Therefore, guards on the shore can contact the fishermen. immediately. Our system gives an indication to the fisherman as well as to the coastal guards. This system notifies the fishermen and the coast guard regarding the whereabouts of the boat.

VII. IMPLEMENTATION:

The GPS device will regularly provide the signal that defines the latitude and longitude and shows the boat position, and it is shown in the LCD. GPS delivers accurate positioning, navigation, and timing. services to users continuously on a daily basis, day and night. GPS saves the storage of the maritime position. While compares the erstwhile maritime restricted position and present position, and the outcome shall be the latitude and longitude degree of the position of the boat is ascertained If the boat is closer to the restricted area, an automatic warning message will be transmitted to the LCD display, which is on the boat. The warning messages are transmitted using a GSM modem.

Fishermen do not mind the warning, and they proceed to enter the barred area automatically. The engine shuts off by means of relay and send via the message to the coast guard. A microcontroller is serially interfaced to a GSM modem and GPS receiver. The primary purpose of this GSM system is to provide constant surveillance of every boat and information provided to the coastal office. When the boat reaches the border, the stored message is compared with the position and the message is sent to the desired authority individual using GSM module.

VIII.HARDWARE COMPONENTS:

a) GSM MODULE:

GSM networks function in several various carrier frequencies, and its frequency is 900 MHz or 1800 MHz. The GSM module is used for message transmission seeking assistance. The GSM utilizes narrowband Time Division Multiple

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Access (TDMA) method of signal transmission. It cannot be used as a component of seas as towers. cannot be kept in the middle of the ocean so it is kept in coastal control office. Therefore the coastal keep receiving the GPS data from the GSM with the assistance of CDMA. The prime purpose of the GSM system is to provide continuous monitoring of every boat and information provided to the coastal office. When the boat crosses the border, the saved message near the comparative position and message delivered to the desired authority individual by GSM module.

b) POWER SUPPLY:

Power supply is taken from the boat dynamo. The DC power supply with positive and negative output voltages of the battery is used, and Arduino operates on low power. A relay is an electrically operated switch. Where a multiple number of relays are controlled by an electromagnet to operate a switch manually, other operation principles are also used, e.g., solid- state relays. Relays are used where one has to turn on a circuit with a low-power signal, where several circuits have to be turned on by one signal. The old relays were used in long-distance telegraph circuits as amplifiers; they duplicated the signal of one circuit and broadcast it on another circuit.

c) GPS MODULE:

A GPS navigation device is any gadget that receives Global Positioning System (GPS) signals for the intent of determining the position of the device on Earth. GPS devices also provide latitude and longitude information, and some also calculate altitude. GPS technology is used in military, aviation, marine, and consumer product applications. The Global Positioning System (GPS) is a space-based navigation system that provides location and time information in any weather. The GPS determines the latitude and longitude of the boat's position and sends the data to the microcontroller.

IX.DISCUSSION

The GPS modem will constantly provide the signal that identifies the latitude and longitude and shows the location of the fishermen to them. Then it provides the output, which is read and shown in the LCD. The same data is provided to the fisherman's mobile, and at the same time, the same data is provided to the sea border security. An EEPROM is employed for storing data received from the GPS receiver. Hardware that deals with microcontrollers includes LCD displays, GPS receivers, and GSM modems. GPS (global positioning system) is becoming more commonly employed for many applications. It delivers accurate positioning, navigation, and timing service to global users around the clock in all weather conditions, day and night, anywhere on or near the globe. Microcontrollers (programmable interface controllers) are programmable electronic circuits that can perform an enormous variety of tasks. They are used in the majority of electronic devices, like alarm systems, computer control systems, and telephones—in fact, nearly any electronic device. Microcontrollers are not very expensive and can be purchased as pre-assembled circuits or as kits that can be assembled by the user. Data from the GPS receiver comes into the microcontroller through the RX and TX of the Arduino. The received data contains many details along with latitude and longitude. The latitude and longitude of the current position are separated from the precise information of GPS. The present locations are being compared with previously saved latitude and longitude of countries boundary points. Initially the latitude is matched with the saved latitude, which determines whether the current position is close to the boundary. The latitude and longitude coordinates for a boundary are saved in individual text files. Depending upon the text files corresponding to Arduino will alter the functioning.

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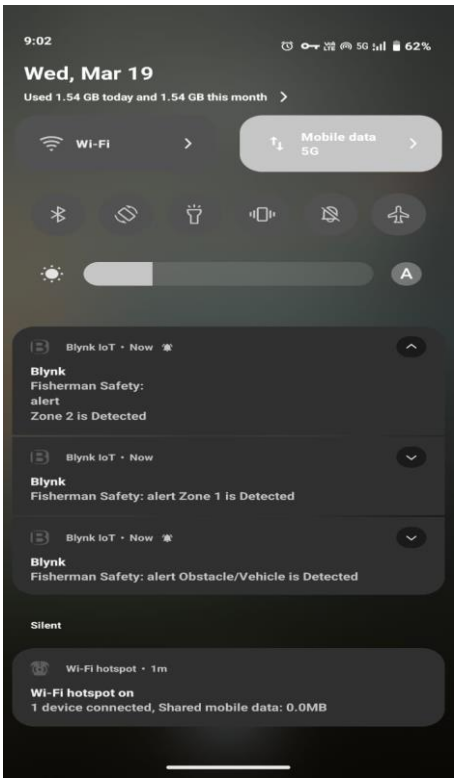

Figure:1

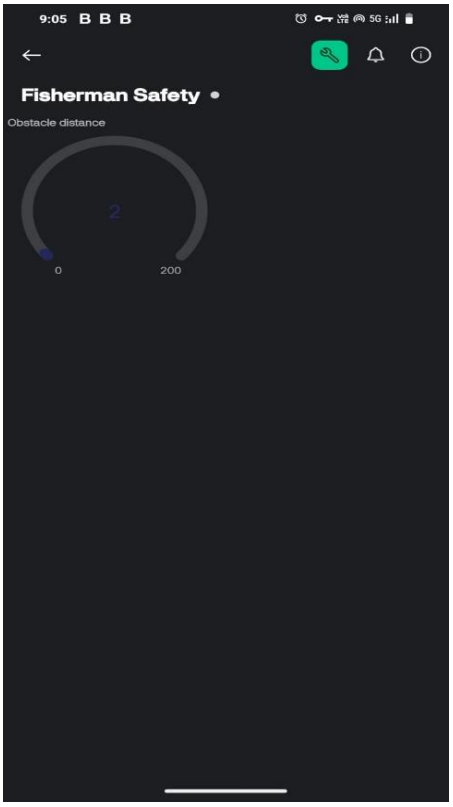

Figure:2

X.CONCLUSION

In the past, there was no valid method to determine the border. The fisherman, during fishing, unknowingly crosses the cross unknowingly, and these can guide them to grave consequences. It is so since there are no proper identification systems. These are the issues that are encountered in the current system. Overcoming this one can introduce new ideas for locating the border. The automatic alarming system will be included with this device, which alerts in the event of any kind of problems. This is constructed in a manner that the application can be conveniently to be used by all the citizens in the areas. Thus, this project allows the citizens to safely fish the border regions.

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