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BOAT ALERT SYSTEM FOR FISHERMAN USING IOT TECHNOLOGY

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ABSTRACT:

The primary goal of developing a border alert system is to protect fishermen from potential interception by Sri Lankan authorities in coastal regions. This system utilizes GPS and GSM technologies. GPS enables tracking of the boat's current location, while GSM facilitates communication. When fishermen approach the warning border, border security forces transmit notifications to the ship's LCD display, alerting the crew. In case the fishermen fail to halt the boat, a relay system is activated to cease its movement by cutting off power to the motor automatically. Create a live warning mechanism to promptly inform fishermen of potential risks such as severe weather, storms, or navigational obstacles. Design a GPS-centered guidance system aiding fishermen in discovering ideal fishing spots and safely traversing various waterways. Incorporate emergency beacons or distress signal tools to enhance the probability of locating and rescuing the distressed fishermen.

KEYWORDS

ESP32, ULTRASONIC SENSOR, DHT 11, GPS MODULE, MOTOR.

I.INTRODUCTION:

In the realm of maritime operations, safety is paramount. As such, the integration cutting-edge technologies become imperative to mitigate risks and ensure the well-being of seafarers. In this context, the fusion of Internet of Things (IoT) technology with predictive weather analysis and engine control mechanisms presents a pioneering solution for enhancing safety measures in boat operations. The Boat Alerting System harnesses the power of IoT devices to provide real-time monitoring and alerting capabilities for seafarers. Through the deployment of sensors such as ultrasonic and DHT sensors, the system can detect obstacles in the boat's path and monitor environmental conditions, including air quality and temperature. This comprehensive data collection enables timely alerts to be issued to fishermen, warning them of potential hazards and impending dangers.

Moreover, the integration of weather prediction algorithms adds an additional layer of safety to the system. By analysing meteorological data and forecasting weather conditions, the system can pre-emptively alert fishermen to adverse weather

phenomena such as storms or heavy rainfall. This proactive approach empowers fishermen to make informed decisions and take necessary precautions to safeguard their vessels and crew. Furthermore, the inclusion of engine control mechanisms allows for remote management of the boat's propulsion system. In the event of an emergency or hazardous situation, the system can automatically adjust the speed or direction of the boat to ensure safe navigation and prevent accidents. This automated engine control feature not only enhances safety but also offers greater efficiency and control over maritime operations. In summary, the Boat Alerting System leveraging IoT technology, weather prediction, and engine control represents a significant advancement in maritime safety measures. By providing real-time alerts, predictive insights, and automated controls, the system empowers seafarers to navigate the seas with confidence, while minimizing risks and maximizing operational efficiency.

II.LITERATURE SURVEY:

Fisherman and Fishing Boat Monitoring System integrating MIMO Technology.

This proposed system design **is** implementation of a Fisherman and Fishing Boat Monitoring System integrating MIMO (Multiple Input Multiple Output) technology and robust database management offers a paradigm shift in enhancing the efficiency and sustainability of maritime activities.

By deploying MIMO technology on fishing vessels, real-time data transmission capabilities are augmented, facilitating seamless communication with onshore monitoring stations. A diverse array of sensors, including GPS, environmental sensors, sonar, and cameras, are strategically installed to capture critical data points continuously. Leveraging MIMO infrastructure, this data is efficiently relayed to a centralized database for storage, analysis, and decision-making processes. Machine learning algorithms further refine this data, providing actionable insights for fishermen and fisheries management authorities. Comprehensive monitoring dashboards and user-friendly interfaces empower stakeholders with intuitive tools for tracking fishing activities and enforcing regulatory compliance. Furthermore, stringent data security measures, including encryption and access controls, safeguard sensitive information. This integrated approach not only optimizes operational efficiency but also promotes responsible fishing practices, contributing to the long-term sustainability of marine ecosystems.

Providing a Border Alert System For Fishermen By Using GPS & GSM Technology In Wireless Sensor Networks.

This team proposed addressing a Border Alert System designed to enhance the safety and security of fishermen operating in maritime borders, leveraging the integration of GPS (Global Positioning System) and GSM (Global System for Mobile Communications) technologies within Wireless Sensor Networks (WSNs). By harnessing the capabilities of GPS for precise location tracking and GSM for wireless communication, the system enables real-time monitoring of fishing vessels and the provision of timely alerts in the event of border breaches or other emergencies.

Deploying wireless sensors strategically across maritime borders, the system continuously gathers location data from fishing vessels, which is then transmitted wirelessly to a central monitoring station. Upon detecting potential breaches or deviations from predefined routes, the system triggers automated alerts to designated authorities and fishermen, facilitating swift response and mitigation efforts. Through the seamless integration of GPS, GSM, and

WSN technologies, this Border Alert System offers a reliable and efficient solution for enhancing maritime security and safeguarding the well-being of fishermen operating in border regions.

Boat Localization And Warning System For Identification Of Border

developing a system for a Border Alert System and Emergency Contact solution tailored for fishermen, leveraging Received Signal Strength Indication (RSSI) technology. The system aims to enhance the safety and security of fishermen operating in maritime borders by providing real-time alerts and emergency communication capabilities. By utilizing RSSI technology, which measures the strength of wireless signals, the system can accurately detect the proximity of fishing vessels to border boundaries or predefined danger zones. Additionally, the system incorporates emergency contact features, enabling fishermen to swiftly communicate distress signals and request assistance in critical situations. Through the integration of RSSI technology, the Border Alert System and Emergency Contact solution offer a reliable and efficient means of safeguarding fishermen and mitigating risks associated with maritime operations.

Border Alert System and Emergency Contact for Fisherman using RSSI

In the realm of maritime safety, the welfare of fishermen and the security of maritime borders are paramount concerns. To address these challenges effectively, the integration of modern technologies becomes imperative. One such innovation is the Border Alert System (BAS) coupled with an Emergency Contact feature, leveraging Received Signal Strength Indicator (RSSI) technology.

The Border Alert System serves as a proactive mechanism designed to enhance maritime security by providing real-time monitoring and detection of unauthorized vessel intrusions into sensitive maritime borders. By utilizing advanced RSSI technology, BAS can precisely track the movement and proximity of vessels within designated zones. This enables prompt detection of any irregularities or potential breaches, empowering authorities to take timely and decisive action to safeguard maritime boundaries.

In parallel, the Emergency Contact feature tailored for fishermen augments safety measures at sea. Recognizing the inherent risks associated with fishing activities, especially in remote or hazardous waters, this feature offers a lifeline for fishermen facing emergencies or distress situations. Through RSSI-enabled communication devices, fishermen can quickly transmit distress signals, pinpointing their precise location to facilitate swift and effective rescue operations.

Border Alerting System For Fishermen Using GPS Module.

In the dynamic world of maritime activities, ensuring the safety and security of fishermen navigating often treacherous waters is a critical imperative. To address this challenge effectively, innovative solutions such as the Border Alerting System (BAS) tailored specifically for fishermen, integrating advanced GPS technology, have emerged as indispensable tools.The Border Alerting System for Fishermen, equipped with a robust GPS module, represents a paradigm shift in maritime safety measures. This cutting-edge system is meticulously designed to provide real-time monitoring and surveillance capabilities, enhancing the safety and security of fishermen operating in diverse maritime environments.

By harnessing the power of GPS technology, BAS offers precise geolocation tracking of fishing vessels, enabling authorities to establish virtual borders and

monitor vessel movements with unprecedented accuracy. In the event of unauthorized border crossings or deviations from predefined routes, the system promptly triggers alerts, facilitating immediate response measures to mitigate potential risks and ensure compliance with maritime regulations.

III.EXISITINGSYSTEM:

The distance of the boat is measured by using the Received Signal Strength received from the slave RSSI LoRa(transmitter). A buzzer alert will also be given to the fishermen. Each boat has a unique number through which a record of how many boats is monitored in the control station . Thus guards in the shore can reach out the fishermen quickly. The system provides an indication to both the fisherman and to the coastal guard. Thus this system alerts the fishermen and the coast guard about the position of the boat. Further attempts of crossing the border neglecting the alert can be prevented by controlling the engine through the engine control unit Other systems include such as the android application, WSN based (RSSI) . But the above systems are not possible due to its short range, high cost, time efficiency, etc. The major drawback of this existing system is that they never provided a accurate way to control the speed of the outboard motor which is used by our common fishermen. All these defects are overcome in our proposed works.

IV.PROPOSED SYSTEM:

Other systems include such as the android application, WSN based (RSSI) . But the above systems are not possible due to its short range, high cost, time efficiency, etc.The major drawback of this existing system is that they never provided a accurate way to control the speed of the outboard motor which is used by our common fishermen. All these defects are overcome in our proposed works. LCD is a display unit which is used to print the status from received from the microcontroller. The GPS receiver is used to find the current location of the fishing boat. Using GPS, the current latitude and longitude values can be determined and is then sent to microcontroller unit.The information can be send through the Blynk application IOT for intimate authority person the boat can be reached certain zone.

An IoT-based boat alert system for fishermen aims to enhance safety and efficiency on the water by leveraging interconnected devices and sensors. The proposed system integrates various components such as GPS trackers, water depth sensors, weather monitors, and collision avoidance systems, all linked through a centralized hub aboard the vessel.

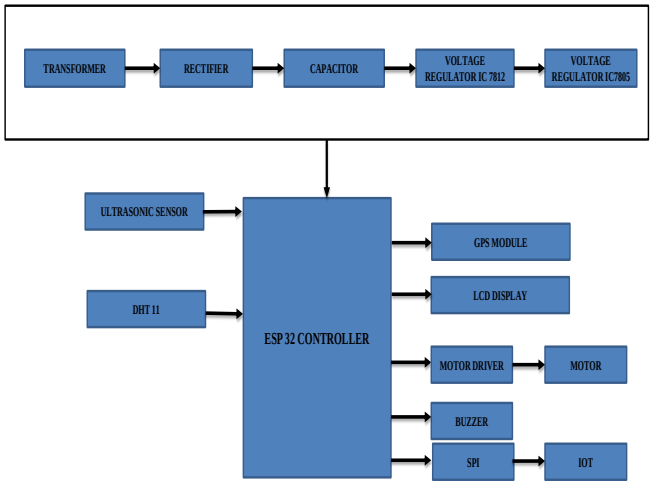

Figure1.1 Block diagram of boat alert system for fisherman. When deployed, this

system continuously collects real-time data on the boat's location, environmental conditions, and potential hazards. Through intelligent algorithms and predictive analytics, the system can alert fishermen to dangers like approaching storms, shallow waters, or nearby vessels, enabling them to take proactive measures to avoid accidents or navigate safely. Additionally, the system can incorporate features like emergency distress signals, automatic man-overboard detection, and communication interfaces to connect with maritime authorities or nearby vessels in case of emergencies. By providing timely and accurate information, this IoT-powered alert system empowers fishermen with greater situational awareness, helping them mitigate risks and improve overall operational outcomes at sea.The proposed IoT-based boat alert system for fishermen is a comprehensive solution aimed at revolutionizing safety and efficiency in maritime activities. At its core, the system integrates a network of interconnected devices and sensors strategically placed throughout the vessel. These include GPS trackers for precise location monitoring, water depth sensors to avoid shallow areas, weather monitoring devices for real-time weather updates, and collision avoidance systems to detect nearby vessels or obstacles. All data collected by these sensors are transmitted to a centralized hub onboard the boat, where advanced algorithms process and analyze the information in real-time. Through predictive analytics, the system can anticipate potential risks such as approaching storms or collision hazards and generate timely alerts for the crew. In addition to alerts, the system features emergency response functionalities like distress signals and man-overboard detection, enabling swift coordination with maritime authorities or nearby vessels in case of emergencies. A user-friendly interface provides easy access to critical information, empowering fishermen with enhanced situational awareness and enabling them to make informed decisions to navigate safely and efficiently. By leveraging IoT technology, this innovative system not only mitigates risks but also improves operational outcomes, ultimately enhancing the safety and productivity.

V.MODIFIED MODELARCHITECTURE:

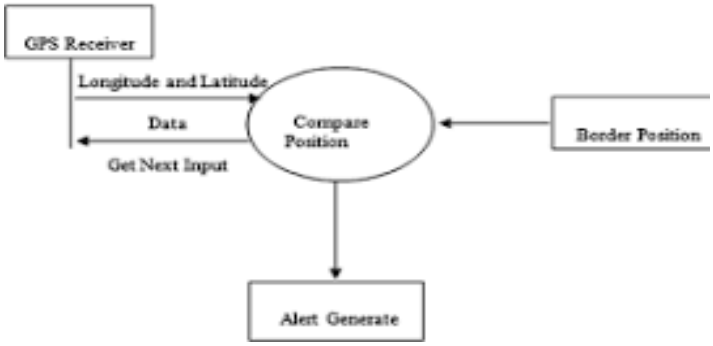

Figure1.2 Architecture of boat alert system for fisherman

VI.CONCLUSION:

The Fisherman Boat Monitoring and Alert System provides a comprehensive solution to enhance the safety and efficiency of fishing operations. By integrating advanced technologies such as GPS tracking, real-time monitoring, and alert systems, it addresses several critical aspects of marine safety and resource management. Through continuous monitoring of vessel locations, weather conditions, and operational parameters, the system enables timely intervention in case of emergencies, such as accidents or adverse weather conditions. Additionally, the implementation of geofencing and automated alerts ensures that fishermen stay within designated areas and are promptly notified of any deviations or potential risks. Furthermore, the system facilitates better resource utilization by providing valuable insights into fishing activities, including catch statistics and fishing zone analysis. This data-driven approach allows for improved decision-

making regarding fishing strategies and resource allocation, ultimately leading to more sustainable and profitable fishing practices. In conclusion, the Fisherman Boat Monitoring and Alert System offers a holistic solution to address the safety and operational challenges faced by fishermen. By leveraging technology to enhance monitoring, communication, and decision support capabilities, it not only improves the safety and efficiency of fishing operations but also contributes to the long-term sustainability of marine ecosystems and livelihoods.

VII.FUTURE SCOPE:

In this paper, with the above discussed surveys in future we can proposed system like Analysing long-term climate trends and patterns can provide valuable insights into how weather conditions in fishing areas may change over time due to climate change. This information can help fishermen adapt their practices and prepare for future challenges associated with shifting weather patterns. By integrating weather condition monitoring into the Fisherman Boat Monitoring and Alert System, fishermen can make more informed decisions, mitigate risks associated with adverse weather conditions, and ultimately improve the safety and sustainability of their fishing operations.

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