Fishermen Helping System

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Abstract: The idea of this project is to prevent the fishermen's boat from crossing the boundary while going to the sea for fishing. When the boat is on board, its position is tracked and checked if it is crossing the border. Once the boat is about to cross the safe border and enter into the prohibited zone, a notification is sent to the control unit in the land and a buzzer is also set in the control unit. The control unit controls and turns the boat into the safe side. This prevents the boat from crossing the country's border and the fishermen and their boat can also reach the shore safely. The position of the boat is tracked by using the GPS (Global Positioning System) and every movement of the boat can be noted. By using a GSM module, the boat can be connected to the control unit in the land. The position of boat is sent to the control unit using a GSM module via cloud. When the border is crossed by the boat, the buzzer goes on in the control unit and the boat is immediately controlled.

Keywords: GPS, GSM Module, Relay, Relay Driver.

I.   INTRODUCTION

This paper deals with the new methodology to save Indianfishermen's valuable life, their boat and their properties from the Sri Lankan navy. This uses pic microcontroller, which is an open source embedded kit available for various purposes. Pic microcontroller is an open-source single-board microcontroller, used to build multidisciplinary projects easily and it is economically cheaper one. Now a days, it is becoming famous and used in most of the IoT based projects. The hardware consists of a PIC 16f877 which is the most advanced microcontroller. It is widely used in modern applications and for most of the experimental work since it is cheap, easily available and high quality. It has high performance RISC CPU, eight level deep hardware stack, built in 368 bytes data memory, 256 bytes EEPROM data memory, 5 I/O ports, 2 serial communication port.

Micro controller understands only the assembly level language or C code which is to be compiled into machine language. To write the program in assembly code, the CPU and hardware knowledge is needed.
Tools are available to program micro controllers. They are KeiluVison, Code Editor, Assembler and C compiler.
The software is able to do compilation and can be automatically boot and runs on the board.
[1,10]. Fishermen usually used the GPS72H equipment to navigate in sea to identify their locations. It is based on Satellite

signals and used to track even in challenging conditions like dense tree cover, deep canyons. It is a light weight, waterproof handheld device. High sensitivity GPS and USB connection yields to acquire satellite signals quickly and to store data through USB. [7] Authors suggested system to navigate vehicles in Automobile Industry. [9] BBC news about the mobile advancement in future.

Built up IOT(Internet Of Thing) system is used to send the boat location to the control room and act the boat based on the control room instruction.
[3] Authors used to monitor remote Vehicles and control them using General Packet Radio Service and GPS. Context aware notification system for the customers are suggested by the authors in[4,5,6,8].

II.   EXISTINGMETHOD

[11] SuggestedIo Ttalk device which is used for dog tracking, indoor and outdoor environment monitoring. The device has simple hardware structures to save energy. [12] Dealt with possible ways of exploring interaction between IoT and Human. Explained about the information dissemination and sharing among human. [13] Authors implement a low cost track system using RFID used to teach students in a "learning by doing" concept. [14] Suggested Kinect to detect postural activities along with additional sensors for accurate data. Kinect sensor data is augmented with data from motion sensors. Hidden Markov Model is used for validating data. [2] Dealt with the accurate position information finding for the vessel arrives in port / departs from port. [4]Another system uses a GPS receiver, gives the current position of the boat.

III.   PROPOSEDWORK

Work flow of the system is first GPS receiver gets the satellite signal and gives the current location of the boat. Then, GPS will give the latitude and longitude of the boat position. Then GSM module is used to store the latitude and longitude in cloud. [3]GSM sends the GPS value to the controller room through cloud.   Border latitude and longitude value is stored in a cloud and the control room gets border value and the location value given by GPS in cloud . The current value got from GPS is compared with predefined border values stored in cloud. Then the control room decides the position of the boat. If the current value and the border value are same, then immediately warning operation will be carried out.The microcontroller gives instruction to the alarm the buzzer.Indication to both fisherman and to control room is sent to save fishermen life and their properties. When the border is crossed a warning system is proclaimed and there will be a warning buzzer and there will be exact

Retrieval Number: E1987017519/2018©BEIESP
Journal Website: www.ijrte.org

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Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)
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Display of distance between present location and border in LCD display. Once the buzzer is on, the control unit uses the microcontroller to immediately control the engine and turns it towards the safe side of the sea. Flow of the proposed work is given in Fig. 1 and Boat Unit Block Diagram is given in Fig. 2.
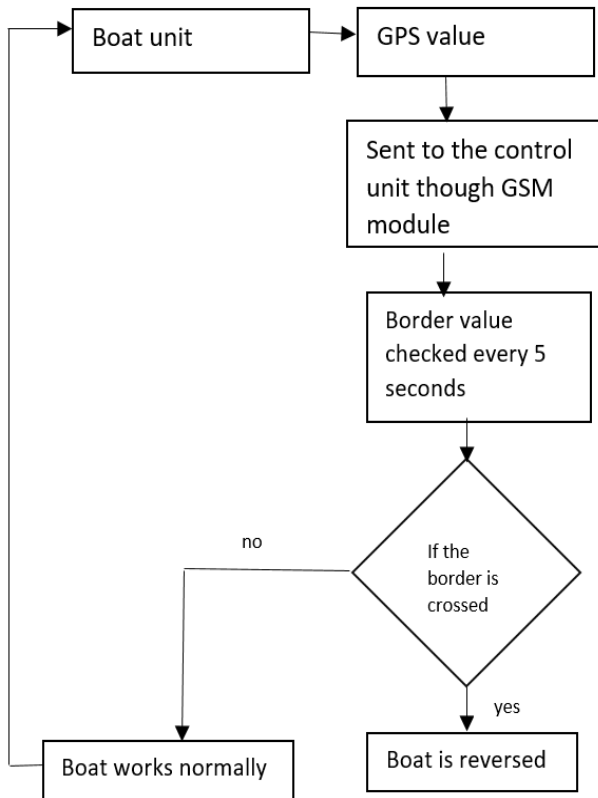

Fig. 1. Flow four Proposed System

A. PIC Micro Controller

PIC micro controller is based on Harvard architectureby Microchip Technology, derived from the PIC1640. PICs are popular in industry to develop projects and also with hobbyists due to their extensive collection of application notes, low cost, wide availability, large user base, free development tools, and serial programming (and re-programming with the use of flash memory) capability.
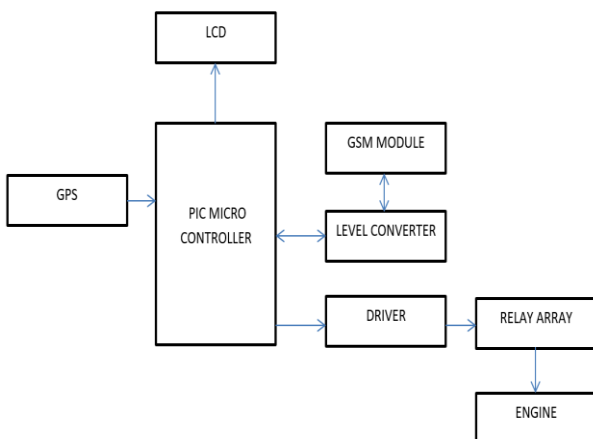

Fig. 2. Boat Unit – Block Diagram

Since RAM servers as a memory and register, there is no distinction between memory space and register space. RAM is referred as a register file, and more number of registers

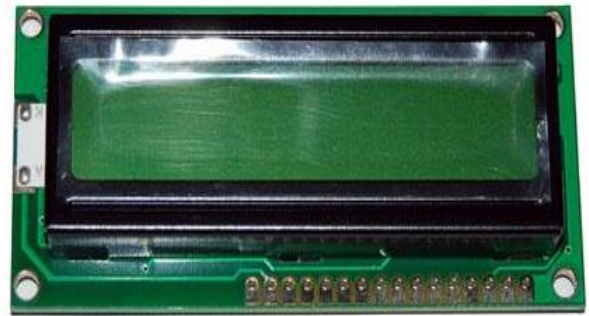can be used for programming which makes programmer easier.

B. LCD Display

Fig. 3.LCD Display Unit

Liquid crystal cell displays (LCDs – Fig. 3) are used in this applicationinstead of LEDs.LCD display isused to display numeric and alphanumeric characters in dot matrix and segmental displays.

There are two types of LCDs. They are

- Dynamic scattering type
- Field effect type

A liquid crystal display (LCD) is a thin, flat panel with the number of color or monochrome pixels filled with liquid crystals and arranged in front of a light source (backlight) or reflector. It is an electronically-modulated optical device. It uses very small amount of electrical powersince they work on the principle of blocking light instead of emitting it. So, it uses battery-powered electronic devices.

C. GPS

The Global Positioning System (GPS) works at all times and in all weather conditions since, it is a space-based global navigation satellite system. It provides the location (Latitude and Longitude values) along with the time information. Since it is satellite based, signals can be received from all directions and in all places. United States government is maintaining this system and it is freely accessible by anyone with a GPS receiver. GPS satellites rotate in a specific orbit, twice a day around the earth. They send signal information to earth. The information is received by GPS receiver. GPS receivers compare the time the satellite sent the signal and the receiver receives the result. This time difference finds the distance of the satellite. Measuring the distance of few other satellites, the user's position can be checked and displayed.

D. Relay Driver

Relays are electromechanical devices which use an electromagnet to operate a pair of movable contacts from an open position to a closed position. It takes small amount of power to operate the relay coil. Electrical relays can be used to switch ON or OFF of low power electronic devices. When it is used in designing electronic projects the loads are controlled using micro controller block. SO, the circuit needs relays, acting as controlled switches.

Depends on the signals received form the micro controller block, the relay controls the load. When the relay gets control signals then the relay is activated and the loads can be switched ON or OFF.

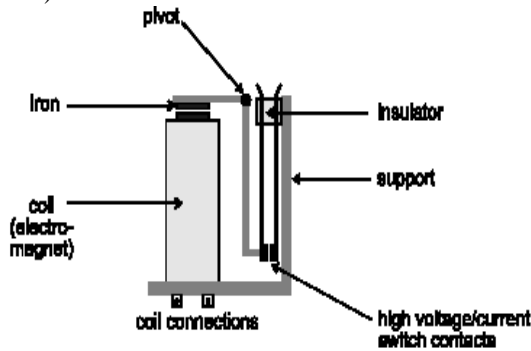The Fig. 4 shows a typical relay (with "normally-open" contacts).


Fig. 4. Relay Driver

E. Relay

A relay is a switch which is operated electrically.When relay contact is NO (normally open), then the contact is open and the relay is not energized. When it is normally closed (NC), then the contact is closed and relay is not energized.

Current flowing through the coil will create a magnetic field which attracts lever and change the switch contacts. Most of the relay have double throw (changeover) switch contacts as shown in the below diagram.
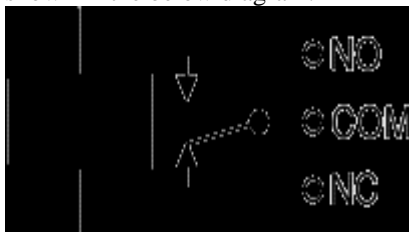
The relay's switch connections are COM, NC and NO. COM is common, moving part of the switch.COM is connected to NC when relay coil is off. COM is connected to NO when the relay coil is on.

F. Control Unit
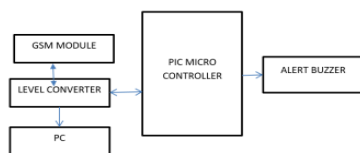
List of Modules

G. Border Detection Module

GPS determines location of the boat and compares it with the pre-defined border value. When it reaches the unsafe area, the message is displayed to the fisherman's boat.

H. Buzzer Alarm

The GSM module stores the GPS values in the cloud. This sends the GPS value to the controller room through cloud. Border value already stored in cloud is compared with the current value sent by the GPS unit and stored in

cloud are compared by the control unit and if both are same, immediate instruction to alarm the buffer is sent for rescue action/ redirection action.

I. Control The Boat Engine

The system gives an indication to relevant people to save fishermen and their properties and alert the base station to provide help. When the border is crossed a warning system is proclaimed and there will be a warning buzzer and there will be exact display of distance between present location and border in LCD display. Once the buzzer is on, the control unit uses the microcontroller to immediately control the engine and turns it towards the safe side of the sea

IV. RESULTANDDISCUSSION

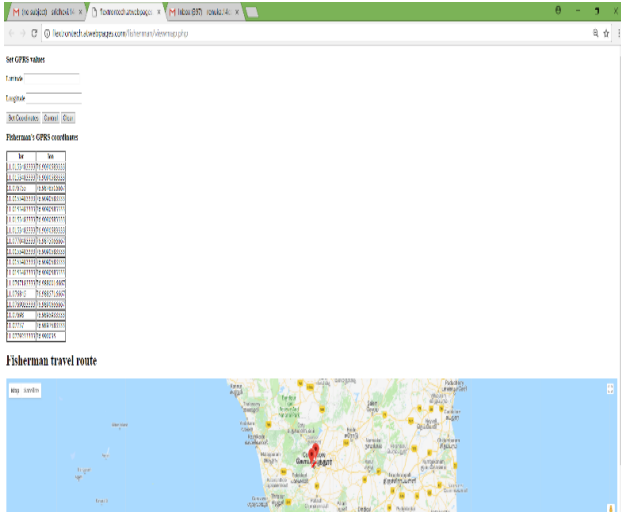Boat unit and control unit hardware module is shown below.
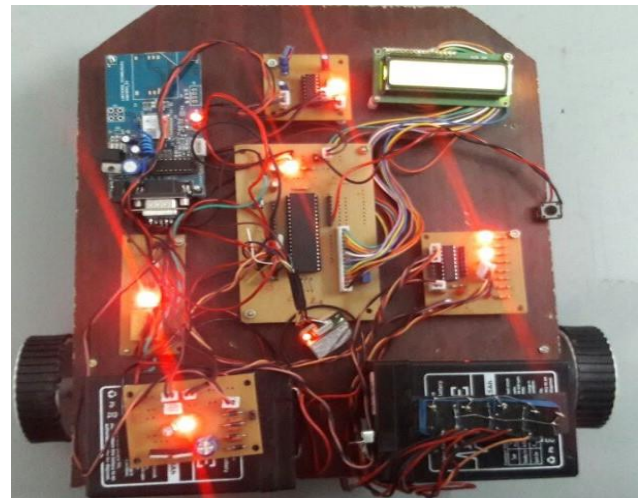
Boat Unit
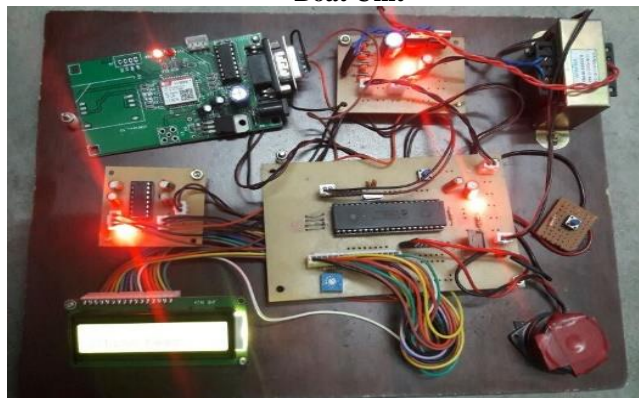
Control Unit

LCD Display

Web Page Display

V. FUTURE WORK

A future improvement or an update that can be done is to implement a camera. By this the position of the boat can be seen and it will be easier to the control unit to control the boat. This fast process helps the boat to travel back sooner and safer.

VI. CONCLUSION

By implementing this proposed system as a real time project helps the fishermen by not going to danger area. This can also be expanded to give warning in many areas like temperature control in boilers, storm, earth quake etc. This system is a useful method for the fisherman and the location of their boat is sent to the land instantly. So by this their each move can be tracked and helps them in safe journey and a safe landing.

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