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Ship to shore communication using GPS and GSM.

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ABSTRACT-Trying to identify the location of fisherman has been challenging for the emergency responders, owners and family members from traditional times to recent times. Fishermen have perished in recent times as a result of abrupt changes in the atmosphere and a lack of effective communication. To save the most valuable human life,a system was developed based on research work with current models. The Arduino Uno, GPS module, and GSM SIM800L are the main components of the proposed model. It uses the GSM module to continuously track the location's latitudes and longitudinal co-ordinates. With the help of the DTH 11 sensor, it also displays temperature and humidity on the LCD screen to indicate climatic conditions. After pushing the button, an emergency message, temperature, and humidity will be instantly sent to the owners and the rescue team.

Keywords: Fisherman, Arduino uno, GPS and GSM module, LCD display, button

I. INTRODUCTION

The number of boating accidents has increased, and many people have died as a result of not receiving necessary assistance in a quick response. we deal with this problem by inspecting the boat circumstances and continuously track the boat's area During any abnormal condition is discovered in the boat then the device sends the instructions to the concerned party through text[1]. The main goal of this document is to follow the boat's location and notify salvage groups and victims if it is in grave danger or in a life-threatening condition. The Arduino Uno, GPS receiver, and GSM SIM 900A module are utilized as key hardware in this article, and the hardware description language is built using the fundamental C programming language. First, the Arduino programmable microcontroller board is used to upload the sketch[2]. The GPS antenna in the GPS module receives information from the GPS satellite, which reveals the position information of latitude and longitude coordinates [3]. The GPS antenna sends the data to the Arduino, which is connected to it. Then, the Arduino sends its data to the GSM module, which connects to the SIM card number specified by the user [4]. In these cases, one can receive a short message from the designated Android mobile phone indicating the place where ship is located. If the ship sinks into the sea or if an emergency occurs, GSM sends the GPS location coordinates to the appropriate rescue team [5]. The Arduino microcontroller is in charge of operating and communicating with the GPS module and GSM receiver. Arduino can sense the surroundings by gathering and showing data from a variety of sensors. The Serial Monitor is included in the Arduino IDE. Its job is to allow messages to be sent from a computer to an Arduino board (through USB) as well as messages to be received from the Arduino [6].

II. METHODOLOGY

Many academics have pushed for the deployment of cutting-edge technology to achieve the objective of location tracking. They discussed GSM, GPS modules, server systems, and other technologies[7]. For this system, Arduino uno is utilised to build a ship to shore communication device, which require hardware implementation. In the hardware implementation of this project, the Arduino uno, GPS module, GSM SIM800L module, DTH11 sensor, button, LCD, and buzzer are all used. When a button pressed, latitude and longitude coordinates of fisherman tracked by the GPS system will be sent to the owner by GSM module along with temperature and humidity which are displayed on the LCD and at the same time Buzzer will be used alert the near by boats[8] as shown In figure1.

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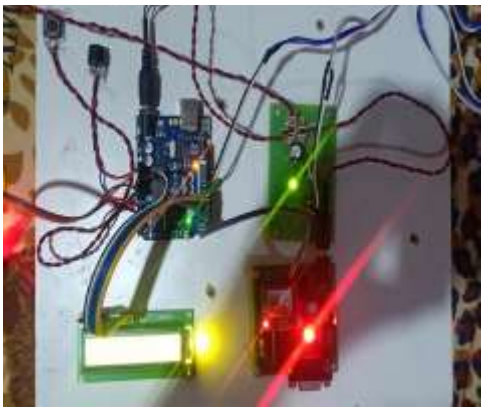
Figure.1



Flow chart of proposed model :

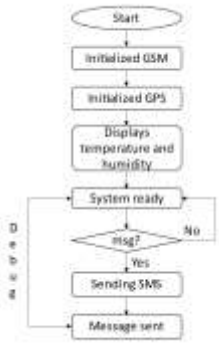


Figure.2

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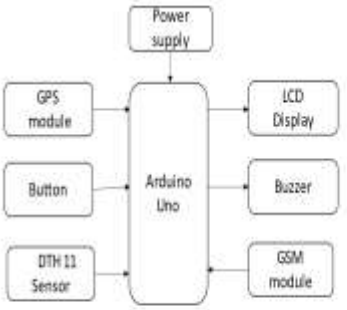
SYSTEM BLOCK DIAGRAM :

The Block diagram of this system consists of following hardware components,they are explained in detail as:



A. POWER SUPPLY:

Any cutting-edge technological invention cannot operate without a source of power. So, in this fast-paced environment, we require a special power source. All electronic components, from diodes to transistors, can only be supplied by a DC source ranging from 5V to 12V. We are employing the cheapest and most generally available energy source, 230V-50Hz, and stepping down, rectifying, filtering, and stabilizing the voltage. A power supply is a component that provides electricity to at least one electric load[9]. It normally transfers one sort of electrical power to another, but it may also convert another type of energy – such as solar, mechanical, or chemical – into electrical energy.

B.GSM 800L :

SIM800L GSM/GPRS module is a small GSM modem that may be used in a variety of IoT projects[10]. You may use this module to perform almost whatever a regular mobile phone can do and send SMS text messages, make or receive phone calls, connect to the internet through GPRS, TCP/IP, and more! To top it all off, the module supports a quad-band GSM/GPRS network, allowing it to be utilized nearly anywhere in the globe[11].

C.DTH11

The DHT11 digital temperature and humidity sensor is reasonably priced. Simply attach this sensor to any microcontroller (Arduino, Raspberry Pi, etc.) to detect humidity and temperature in real time. A moisture-retaining substrate acts as a dielectric between the humidity sensor capacitor's two electrodes. The capacitance value fluctuates with humidity levels[12]. The integrated circuit measures, processes, and digitally transforms resistance values. The DHT11 has a temperature range of 0 to 50 degrees Celsius and a 2-degree precision. This sensor has a humidity range between20 to 80 percent about a 5

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percent accuracy. It sends out one reading per second. The DHT11 is a semiconductor transistor with an operating voltage of 3 to 5v.

D.GPS :

The position is determined from the distance measurements to satellites. From the figure, the four satellites are used to determine the position of the receiver on the earth.It's an universal navigation satellite system that transmits geolocation and time information to a GPS receiver wherever on or near the earth where four or more GPS satellites can be seen without obstruction[13]. The GPS system does not require the user to send any data, and it works regardless of whether or not the user has access to a phone or the internet. Military, civic, and commercial users all across the world rely on the GPS system for crucial positioning. GPS satellites broadcast their current time and position in real time[14]. A GPS receiver tracks numerous satellites and uses an equation to calculate the receiver's accurate position and divergence from actual time[15].By using this GPS we can find the longitude and latitude axis of the fisherman, so that owner can identify that the fisherman is in that particular location.Then it will be easy for owner to save the fisherman if he faces any trouble during his hunting[16].

E . BUZZER

A buzzer is a device that sends out audible signals. It is a device that emits a buzzing sound similar to that of an electric bell. It is typically powered by direct current voltage. A buzzer is employed in this gadget to signal that the message has been conveyed to the owner. A beeper or buzzer, for example, can be electromechanical or mechanical in nature. The primary function of this is to transform the audio signal to sound. In general, it is powered by DC voltage and is utilized in timers, alarm devices, printers, alarms, computers, and so on. It may make various sounds such as alert, music, bell, and siren according on the design. The buzzer's pin arrangement is illustrated below. It has two pins, one positive and one negative. This is symbolised by the '+' sign or a longer terminal. This terminal is supplied by 6 volts, whereas the negative terminal is represented by the '-'symbol or short terminal, which is linked to the GND terminal. This buzzer makes a sound after pushing the button, indicating that the message has been sent to the owner or that the temperature has been raised.

D.ARDUINO UNO :

The Arduino Uno is a free and open-source electronics platform featuring basic hardware and software[17]. Codes are dipped in this programming to achieve specified outputs. Arduino boards may convert inputs such as a sensor light, a finger on a button, or a Twitter tweet into outputs such as driving a motor, turning on an LED. You can operate your board by sending instructions to the board's microcontroller. A USB connection or an external power supply can be used to power the Arduino UNO. External power supply are frequently made up of an AC to DC converter or a battery.

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Connecting the adapter to the Arduino Uno is as simple as connecting it into the Arduino board's power port[18]. Similarly, the battery leads can be connected to the Vin and GND pins of the POWER connection. The suggested voltage range is 7 to 12 voL

16*2LCD

LCD (Liquid Crystal Display) is the best display in the development of embedded prototypes since it is cheap, flexible in availability, easy to programme, and reliable. These exhibits are frequently encountered in our day-to-day lives and in a number of situations. Calculators, PCOs, and many other similar applications in both DIY and commercial projects. Whereas,16 by 2 LCD displays are most extensively used in different circuits and refers to the display of 16 characters of data in two rows at a time. Each character is displayed as a 5 by 7 pixel matrix[19]. If an LCD is connected to a microcontroller, the power supply should not exceed 5 volts.

III. RESULTS AND DISCUSSIONS

The proposed model and its hardware design was shown in fig. In this paper,The GSM module was used in this study to transmit and receive messages from another GSM number. If someone is at high risk,press the switch so that the relatives get the latitude and longitude coordinates along with google map location as a text message from the threaten persons[20].As we can see that we have started from the base and reached around 15km as shown in figure

OUTPUTS

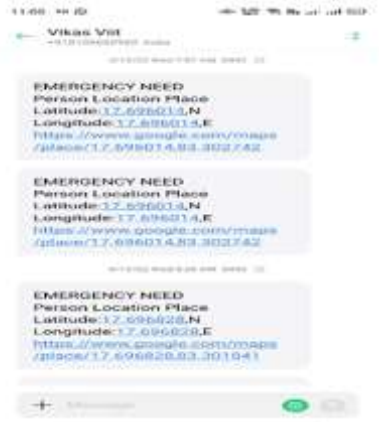

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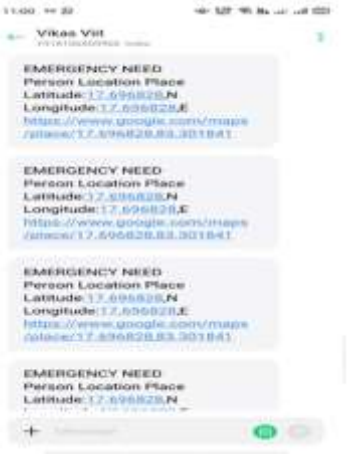
Figure.a

Figure.b



IV. CONCLUSION

This approach is especially useful in terms of providing stability and optimism to fishers and their families.. This concept is offered to save the lives of fishermen whose lives are at risk at sea. It is dependable, adaptable, and inexpensive. When the fishermen went out to fish in the sea at that time, they encountered problems such as cyclones, toofans, fuel, temperature, and humidity, among others. When they feel threatened, they push a button on the gadget, which then sends the live coordinates acquired by the GPS receiver module to the rescue team's and family members' mobile phones through the GSM module. It alerts the rescue crew and family members by transferring useful information, resulting in the saving of many lives in a short amount of time. The Arduino is at the center of this project, controlling the entire process. The alert system which we have developed will provide an effective solution for the fisherman's problems. In this way, this system can save the lives of many fishermen.

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