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EFFECTIVE INFORMATION SYSTEM FOR COSTAL REGION USING ARDUINO

Dr. (Professor) Tin Tin Nwet[1]

[1]Faculty of Computer Systems and Technologies, University of Computer Studies, Sittway, Myanmar

ABSTRACT

The design of effective information system is easy to perform tasks which are difficult or impossible for human's performed. In day-to-day life, we hear about the many accidents confronted which the causes of the sinking ships or motor vehicles in the coastal region. The target of this system is used to safe the passengers and sailors after accident in right time. In the system, using GPS (Global Positioning System), GSM (Global system for mobile communication), Arduino and 12V Buzzer. GSM is to call phone and send message to the ship's owner and contact person. GPS is to find the ship location. This paper presents the design of ship which can take direct, real time from a hardware devices and software control. It consists of transmitter and receiver parts and programmed using Arduino. It was developed with Arduino Uno, GSM, GPS, Accelerometer, variable resistors and bumper switch.

Keywords: GPS, GSM, ARDUINO Uno, Resistors

1. INTRODUCTION

My native is Rakhine State in Myanmar. It is costal region and plenty of rivers. Security in travel is primary concern for everyone. In my country, Myanmar, many accidents are caused because for the bad weather conditions in coastal region during rainy season. In coastal region, the main transportations are ships and boats. This system can be help to reduce the number deaths. The leakage of gases after accidents This paper comes with consistent solutions for these problems. The passengers and sailors are protected from dangerous situations and to save their life. This project is designed to inform about the location of ship it is sank that is occurring to the family members. This project uses accelerometer, GSM, GPS, Buzzer and Arduino.

If the ship is emits the location of the ship's owner via GSM communication. Accelerometer can detect the unevenness of ship and vibrations when an accident is occurred. This sends a signal to microcontroller. When the ship is sank, detection system using GSM and GPS modems is done. Messages notifications are sent to the mobile number and ring which is prescribed. This monitoring system is composed of a GPS receiver, Arduino and a GSM Modern. GPS receiver gets the Geo satellite information satellites in the form of latitude and longitude. The Arduino processes this information and is sent to the user/owner using GSM modem. At that time GPS is showed ship's location. Major deaths occur due to the storm in rainy season, collide with obstacle and overload. This system can support only reduce the deaths after sinking.

2. REQUIRED COMPONENTS

i. Arduino Uno
ii. GSM module (SIM 900A)
iii. Accelerometer (ADxL335)
iv. Push Button
v. NEO-6M GPS Module

i. Arduino Uno

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino and initially released in 2010. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz, a USB connection, a power jack, an ICSP header and a reset button. The board is input/output pins that may be interfaced to various expansion boards and other circuits.

In this project, Arduino UNO board is used as a main component of the whole project and it determines inputs and outputs of each component. It can accept programs from other devices that needs to control I/O ports such as GSM module, GPS module, Accelerometer, Buzzer, Push button.

Figure 1. Arduino Uno

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ii. GSM module (SIM 900A)

In this we are using GSM Modem and its frequency up to 900MHz or 1800MHz. GSM module is utilized for transmission of message looking for help. The GSM makes use of narrowband Time Division Multiple Access (TDMA) techique for transmitting signals.The main aim of this GSM system is to ensure contionuous monitoring of ship and information given to the ship's ownner. When the ship is sinking, the stored message adjacent to with compared position and message sent to the desired contact person by using GSM module.

It is the smallest and cheapest module for GPRS/GSM communication. It is a digital mobile network that is widely used by mobile phone users in the world. In this paper, it uses a 900 and 1800MHz frequency band and allows users to receive/ send mobile calls and SMS. The Module SIM900A looks like a single chip but it has a bunch of features that can help to build almost many commercial applications. There are a total of 68 pins on SIM900A and these pins help to build the applications. In this project, a SIM card is used in GSM module to send location alert message when someone is trying to move or ride motorcycle without any permission of the owner.

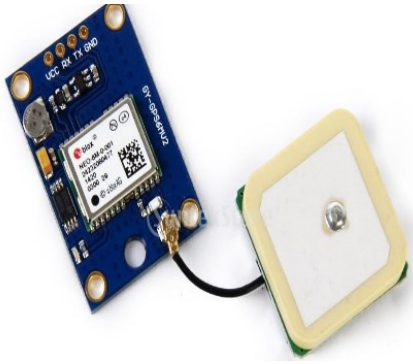

Figure 2. GSM Module

iii. Accelerometer (ADxL335)

An accelerometer sensor is a sensor that can measure acceleration. It is usually composed of masses, dampers, elastic components, sensitive components and adaptive circuits. It is a small, thin, low power, complete 3-axis accelerometer with signal conditioned voltage outputs. In the process of acceleration, the sensor obtains the acceleration value by using Newton's second law, measuring the inertial force on the mass block. In the process of acceleration, the sensor obtains the acceleration value by using Newton's second law, measuring the inertial force on the mass block. VCC: This is the power pin. From Arduino Uno 3.3 volt or 5 volt connect on this pin. XOUT: X out pin outputs the analog value produced in proportion to acceleration along X axis. YOUT**:** Y out pin outputs the analog value produced in proportion to acceleration along Y axis.

In this project, accelerometer sensor is used to determine whether there is a ship or boat accident or not. It is an intermediate device between ship and GSM module to communicate with the nearest emergency recuse organization.

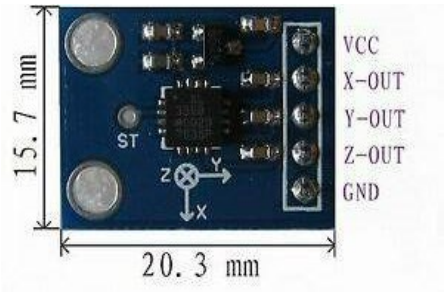

Figure 3. Accelerometer

iv. Push Button

Push button is a simple switch mechanism to control some aspect of a machine or a process. Buttons are typically made out of hard material, usually plastic or metal. The surface is usually flat or shaped to accommodate the human finger or hand, so as to easily depressed or pushed. The main function of a push button is to switch something either on or off. There are different types of push button switches and each different type has a different function.

Figure 4. Push Button

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V. NEO-6M GPS Module

GPS or Global Positioning System is a satellite navigation system and which two or more signals, received from satellites, are used to determine the receiver's positions on the globe. The GPS will be detected by an identification tag that was created to these tools while added with some mobile phones and GSM as an intermediate device that connects to a device microcontroller.

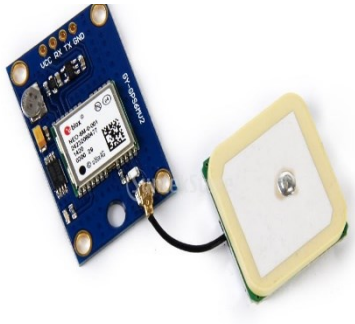

Figure 5 NEO-6M GPS Module

Neo 6m GPS Module is one of the most frequently used GPS modules throughout the world. The Neo-6m GPS module is used for Location Tracking. It receives and sends the broadcast C/A code signals from satellites like a radio and records the relvant position speed and time information, etc. The working/operation of the Global positioning system is based on the trilateration mathematical principle. The protocols of all GPS modules on the market are NMEA. The target location is confirmed by the 4 satellites. And three satellites are used to trace the location. A fourth satellite is used to confirm the target location of each of those space vehicles. The GPS consists of a satellite control station, and a monitor station and receiver. In this system, GPS is used to indicate the position location ships after any accident.

3. METHODOLOGY

The GPS device will repetitively give the signal which determines the latitude and longitude, indicates the position of the ship. This display in the LCD. The hardware which interfaces with microcontroller, LCD, GSM modem and GPS Receiver. GPS provides consistent positioning, navigation, and timing services to users on a continuous basis in every day and night. Then GPS store the storage of the maritime position. While comparing the previous maritime restricted position. The results will be the latitude and longitudinal degree of the ship's location is determined. A microcontroller is interfaced serially to a GSM modem bandgaps receiver. Figure 1 shows the block diagram of the entire system.

This system is used in coastal region during ship sinking. It causes because for the overloading, the wind is fierce the bad weather condition and the ship is collided with the obstacles. IN system construction, it mainly consists of two main part s namely as software and hardware parts. Software part includes embedded software for interfacing of various Hardware components like LCD, microcontroller, GSM, GPS etc.

When the ship is sank in the river, along with this scheme we are also going to monitor behavior of ship in both inside and outside of the ship. Bumper switch is auto alarm. To implement this approach GSM and GPS system can be used, it will also help to reduce the number deaths by given information which caused due to lack of proper treatment.

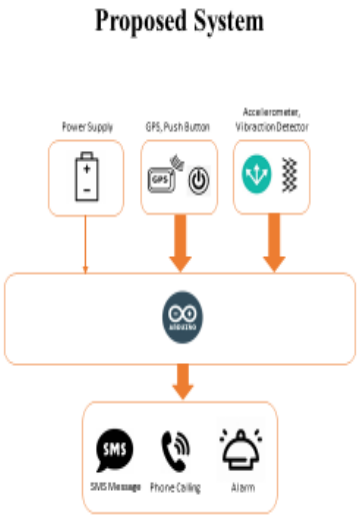

Figure 6. Proposed System

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4. PAPER RATIONAL

In this paper, GSM is used to send the messages and ring with the contact person phone numbers. Here one input is given as GPS which is used to describe the motor vehicle or ship location. Another input accelerometer sensor is sensing transducer that provides an output proportional to acceleration vibration and shock. Figure2. is showed the effective information system.

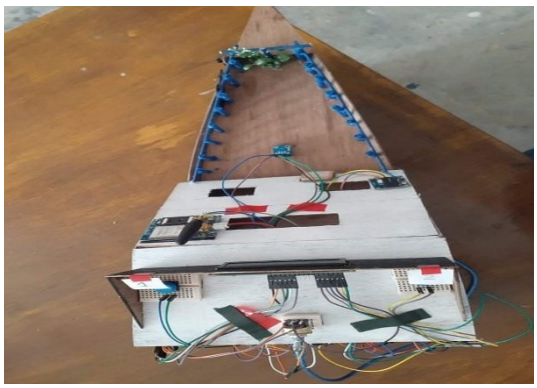

Figure 7. Effective Information System

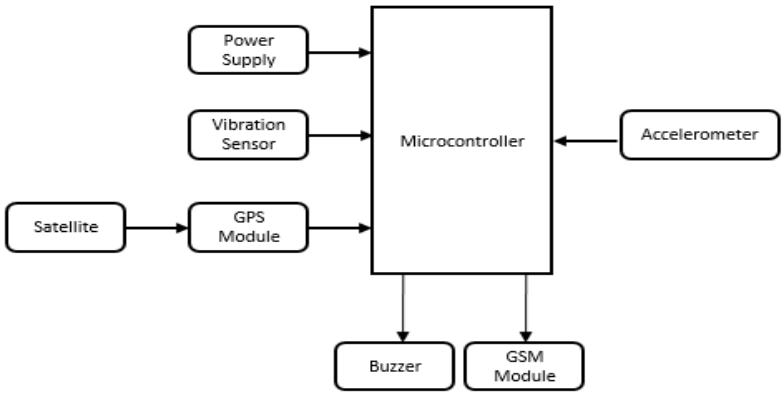

Figure 8. Block Diagram

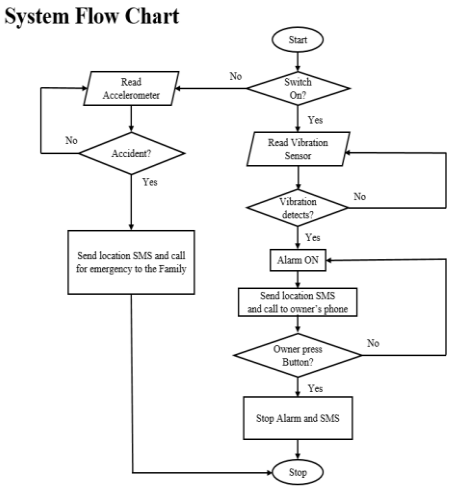

Figure 9. System Flow Chart

5. RESULT & DISCUSSION

Figure 3. Shows the block diagram of the devices. This system is successfully set up. By the use of this system, the passengers are traveled comfortable and reduce the number deaths which caused due to lack of proper treatment at the right time Figure 9 shows the hardware devices are girding.

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But this system has a few of weak point.If the ship is sank vertically downward, the accelerometer is no active and then LCD, GSM, GPS and bumper switch are not done. This is weak point of this system.

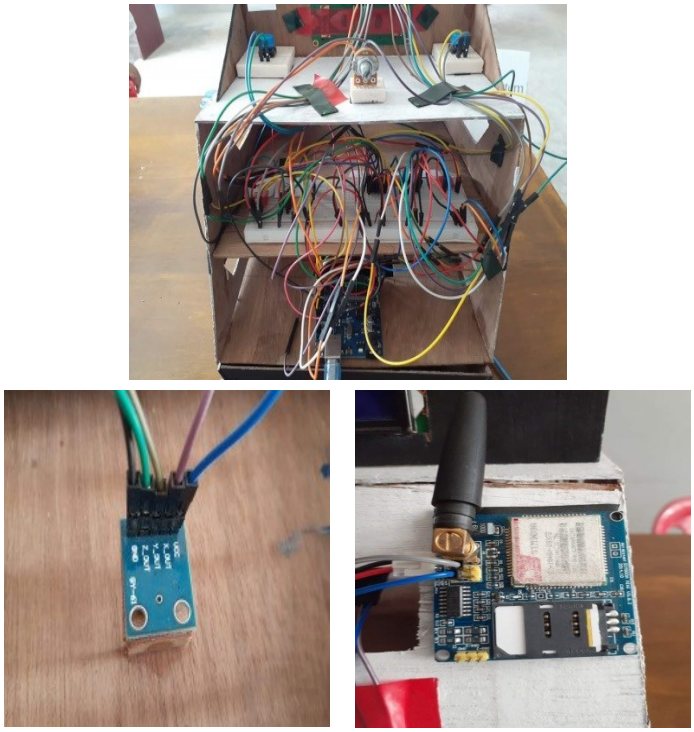

Figure 9. Hardware devices setup

6. CONCLUSION

The objective of this work is achieved, which is effective information system with accelerometer. It is developed successfully as the movement is easy to control and user-friendly. Proposed system can notify the ship's owner and their contact person. Future scope of this system is it can also check whenever the accident happens will notify immediately to the numbers provided in application by the end user and therefore people in the ship can get service as early as possible by minimizing the casualties. To implement this approach of GSM and GPS, it will also help to reduce the number deaths which caused due to lack of proper treatment during sinking of ship.

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7. REFERENCES

[1] International Journal of Progress Sciences and Technologies (IJPSAT) "Effective Information System in Vehicle Using Arduino"

[2] Alcohol Detection System in Vehicle Using Arduino" "International Research Journal of Engineering and Technology volume:04 Issue 06:June 2017.

[3] International Journal of Recent Trends in Engineering & Research (IJRTER)Volume 04, Issue 07; July -2018[ISSN: 2455-1457]

[4] International Journal of Engineering Research & Technology, vol.5 Issue 03, March-2016 "GPS based Border Alert System using Arduino".