



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 5, May 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

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Development of IOT based Flood Monitoring & Notification System on Web Dashboard for Meteorological Department

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ABSTRACT: The development strategies of Internet of Things grounded flood tide monitoring and warning system with rainfall predicting through open weather API. This design is grounded on the open source electronic platform i.e. Node MCU. The Node MCU is to be set up multiple different device similar as ultrasonic sensor for the water level discovery by landing the time between transmitting and entering sound swells, temperature and moisture sensor DHT11/ AM2302 for assaying the humidity content and water inflow sensor for assessing the speed of water inflow. Further, these values entered by different sensors are to be transferred to the Android Application which is developed with the technologies similar as Java, XML, Android plant. The final system will be stationed in the flood tide prone areas for early discovery and forestallment of flood tide.

KEYWORDS- Node MCU, API, Ultrasonic sensors, Water level sensor.

I. INTRODUCTION

In a peninsular country like India, with extreme rainfall and climatic conditions, the circumstance of heavy downfall is normal. Multiple times, the appearance of veritably heavy rain results in the heavy discharge of water or because of the unforeseen melting of the glaciers due to global warming. Especially, in the thunderstorm which typically begins in the medial of June and lasts till October, thousands of people lost their lives by drowning and their territories were collapsed. The left us were vacated by the state and central disaster relief authorities. The severe waterlogging brought daily work to halt. In order to save the lives of the people, their niche and the frugality, the major step is to cover the data on real time base and if the situation is reaching a certain threshold, also alert is to be handed to each individual living in the area which is presently at threat. Indeed, if it's delicate to abandon the natural disaster but the obligatory way is to be taken by the government agencies to shift the population to a safe region and the losses will get reduced to lower than 30. In this ultramodern period, there are multiple systems working and are stationed at different places but the alert announcement is passed to government agencies and this ends up in decelerating down the process. The reason behind this is that flood tide is veritably instinctual disaster and government agencies have to follow multiple way before reaching to a decision. In this case, mindfulness among the people is veritably necessary along with the government officers. So that a combined and better result will be achieved. In our system, it's combined with forecasting through rainfall soothsaying. The inflow of water is tasted by water inflow sensor which will eventually help in assessing the intensity of flood tide and water position by the help of ultrasonic sensor which will be done by propagating sound swells. All this information will be showcased in the operation. The android operation will be developed using Java, XML, Android plant. The operation not only includes the data from IOT but also includes rainfall predicting. The rainfall information will be gathered using Open Weather API



which will give real time climatic information. This will affect in the avoidance of loss to humanity and frugality as well. The extreme climatic changes due to the effect from colorful mortal conditioning similar as profanations, slice of innumerable trees and too important of gas emigration are the some of the main reason for natural disasters that do in worldwide. The most common factor that beget major damage to life, property and country “ s frugality is the flood tide. Flooding is brought on by an increased volume of water in lake or swash when it's overflowing. When a levee fractures and suddenly releasing a massive volume of water not only houses and property are damaged, sewage overflow and chemical spillage also leads to a variety of conditions latterly. To manage these kind of situations and alert people understanding of increased water position and speed of water inflow are precious for discovering implicit soberness of the flood tide. This design presents the details of how the data- suchlike flood tide position and rain intensity are collected from detectors and made available on pall and transferring alert dispatches by using jeer pi, Thing speak- an IOT platform and a Global System for Mobile communication (GSM) and short communication service (SMS) to rely data from sensors to computers or directly warn the People of that area through their mobile phone. The data from the IOT pall can be penetrated by android smart phones at anytime from anywhere in the world using the mobile app effects view.

II. LITERATURE SURVEY/BACKGROUND

The papers have reviewed on the operation of the natural disaster in Malaysia. In some areas in Malaysia during flood tide, water was over to 3- 4m deep. An composition by Leman et. Al highlights the stylish possible way to deal with when disaster strikes. The testament has been divided into five phases of action- mindfulness, Preparedness, Revert, Recovery and Mitigation. Leman etc. Al has researched on digital processing of image to gain the feedback for instant flooding and water logging and remote cyber surveillance system. For the development of flood tide threat reduction, the pivotal part is to first understand the dangerous miracle and the largely dangerous consequences on the society.

The IOT based systems are preferred by researchers because it senses the data from different sensors without humaninterference. These systemsare combinedwith water level sensors such as ultrasonicfor water level detection butthemajordrawbackisthatitmissesalerts system.Pressuresensorswereusedtogetwaterlevelmeasurementsateach second so that accuracy has been increased. Jana Priya etc. Al and Satria etc. AL demonstrated the concept ofmeasuring sensors. The trend in shows the usage of mobile phones is very common and almost 80% of the audienceholds a smartphone. So in Malaysia, they decided to provide SMS alert to give an early warning. Literature Survey on Flood Prediction and Alerting using IoT and Machine Learning

Theimportanceofknowingenvironmentalconditionsisundoubtedlythesedays.Knowledgeofhavingenvironmental conditions will help us to know better about our surroundings.Due to global warming it has come harder to determine the type of weather around us. therefore, frequent monitoring and forecasting of the rainfall is delicate. therefore, we need proper information about the rainfall. therefore, the decision maker can take the applicable decision of the rainfall. IoT Based Flood Prediction Model.

The development of smart flood monitoring system using ultrasonic sensor. Transmitter unit consisting of first knot MCU, an ultrasonic detector will determine the water position during flooding and display it on the TV. also, the data detected from the ultrasonic detectors will be transferred to the Blynk operation via wireless connection. The data are incontinently collected and stored in a devoted database for recording purposes. In order to warn the person. A water position detector is used to descry the asked parameter and if the water position reaches the parameter the signal will be freed in real time to social network like Twitter. A pall garcon was configured as data depository. The dimension of water position is displayed in remote dashboard. The proposed result with intertwined sensitive system that allows inner monitoring of water quality. cautions and applicable data are transmitted over the internet to a pall garcon and can be entered by stoner terminal possessed by consumer. The outgrowth of water dimension is displayed in web grounded remote dashboard.

III. PROPOSED WORK/SYSTEM

The idea is to develop a device which is going to save frugality, society, lives and their niche. Using colorful widgets and detectors will increase the perfection. Keeping that factor in mind, we're developing a device which a stoner need to install in the smartphone, rest all the analysis work is done by the system and alert is handed in the form of announcements.

In this design, some tackle bias is used similar as power force, ultrasonic detectors, temperature and moisture detectors and electronic platform Arduino. The tackle is connected with Wi- Fi module which enable the system to connect and partake the information through internet.

Sensors-There are multiple types of sensors depend on their deployment field. They are located at certain point to get and sense the input. There are three different types of sensors used in this project. They are as follows-

1) **Ultrasonicsensor-**

For water position dimension, we've used ultrasonic detectors. This detector will work on sound navigation and ranging. It'll work by transmitting the surge of short and high frequentness and echo will get returned back, depending on these the position will be measured. An ultrasonic detector is an electronic device that measures the distance of a target object by emitting ultrasonic sound swells, and converts the reflected sound into an electrical signal.

2) **NODEMCU:**

It's a microcontroller board on which all the detectors are connected with built- in Wi- Fi module. The Node MCU ESP32 board (in some cases also known as ESP32- DevkitC) is completely supported by ESP Home. Simply choose ESP32 when the ESP Home wizard asks you for your platform and node mcu 32s as the board type. The firmware was originally developed as is a companion design to the popular ESP8266- basedNodeMCUdevelopment modules, but the design is now community- supported, and the firmware can now be run on any ESP module. ESP32 is a series of low- cost, low- power system on a chip microcontroller with integrated Wi- Fi and binary- mode Bluetooth.

3) **Temperature and humidity sensor-**

The sensor comes with a devoted NTC to measure temperature and an 8- bit microcontroller to affair the values of temperature and humidity as periodical data. The sensor is also factory calibrated and hence easy to chapter with other microcontrollers. The detector can measure temperature from 0 °C to 50 °C and humidity from 20 to 90with a delicacy of ± 1 °C and ± 1 . This will help in getting the real time temperature and moisture from the atmosphere.

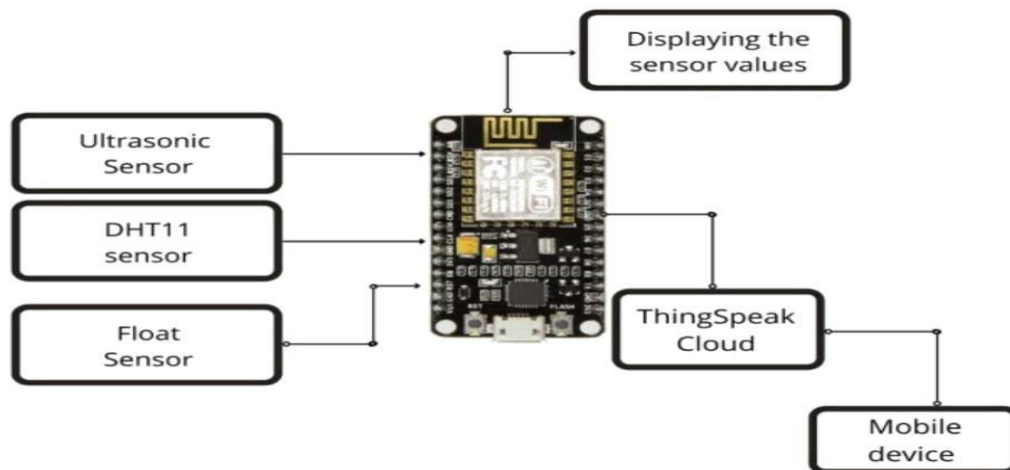


Fig1.Hardware blockdiagram

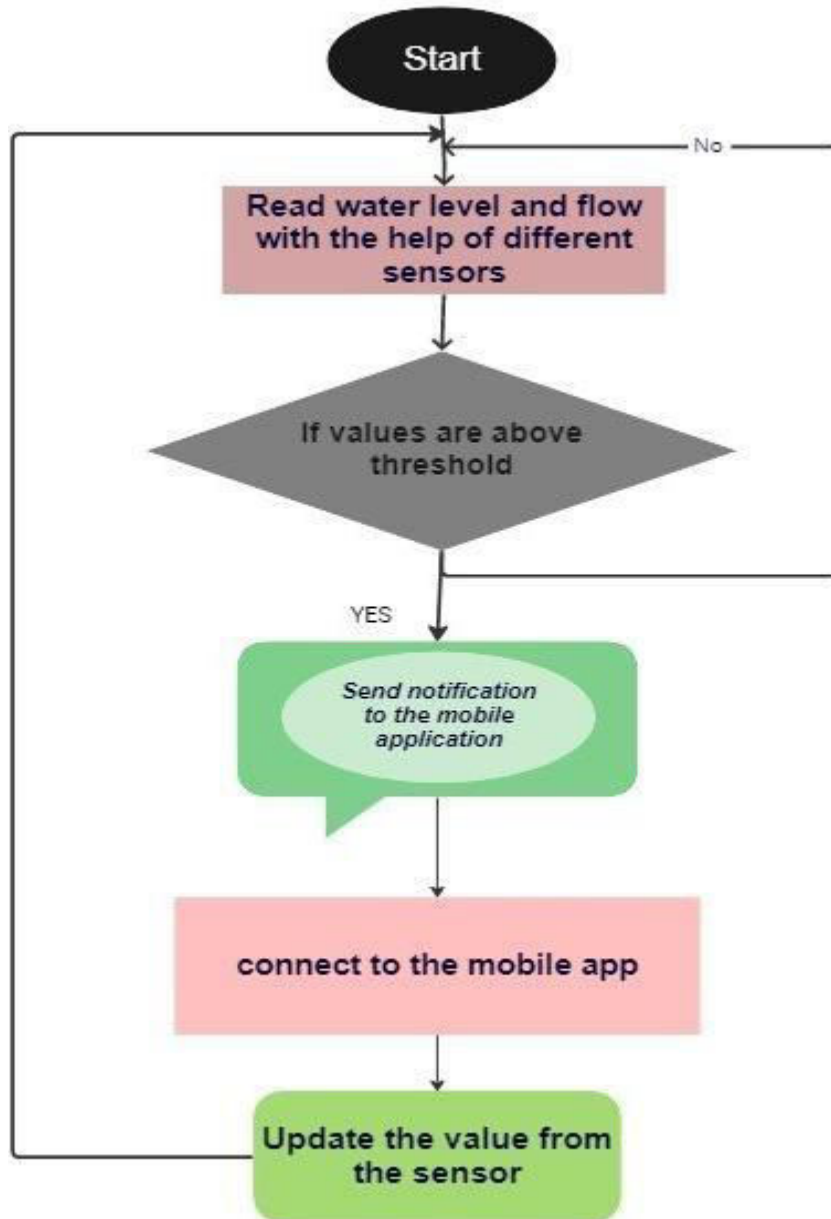


Figure 2.Data Flowchart

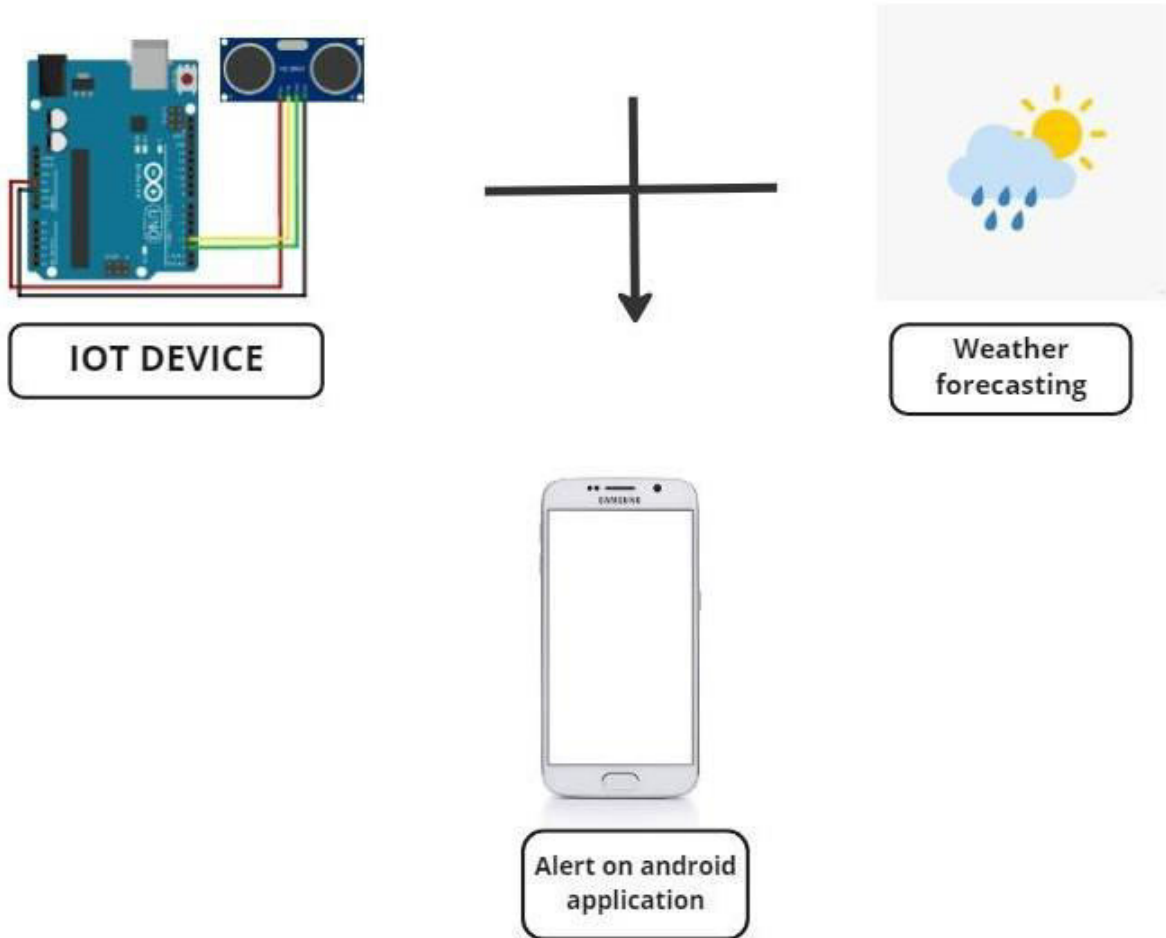


Figure 3. Workingmodel

IV. RESULT AND DISCUSSIONS

There are many earlier works provided by the researchers in the field of IOT but most of them either lacks precision or they are highly expensive. Thus, they are inaccessible to the user. In this module, we are making a device which will sense the possibility of flood, firstly by analyzing values from the IOT device and then checking the weather forecast. The work will not end here, it will keep on reading the values at each and every second and updating if it is higher than threshold. So, by installing it now you can easily save your life as well as your society.

V. CONCLUSION

This design highlights the possibility to give an alert system that will overcome the threat of flood tide. It can also contribute to multiple government agencies or authority that can eventually help the society and humanity about the flood tide like dangerous natural disaster. The model proposed has been formerly tested and it's working as presented in this paper. It'll cover each and every aspect that can lead to flood. However, it'll transmit an alert instantaneously, If the water position rises along with the speed. It also ensures increased availability in dealing and returning to this disastrous incident. In summary, it'll help the community in taking quick opinions and planning against this disaster.



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