**PVG’s College of Engineering, Nashik-4**

**Department of Computer Engineering**

**PROJECT SYNOPIS**

Title: A Real Time Solution to Flood Monitoring System using IoT and Wireless Networks

Academic Year: 2019-20

Group ID: \_\_\_\_\_\_\_\_

Problem Definition: To design the flood alert detection and monitoring system using Internet of Things for provide the citizens for disaster management.

Aims & Objectives:

This flood alert system is basically useful to get idea about flood in forecast to do the sensing of the incoming water level for detection of flood is done by implementing sensors. In this way water level will be sensed by the sensor and concerned messages will be given to the controller then it will take the further action on that command.

This system is a system to deliver information in real time

to a user by applying IoT technologies as the monitoring

system. All the data that collected will be transmitted to end

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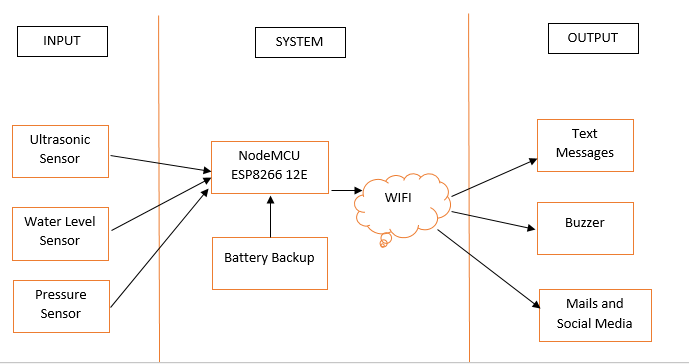
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Relevant Theory:

At present, many research works on IoT in disaster domain have been conducted. This section will provide a summary on research works that implement IoT technologies for addressing natural disasters. IoT technologies give benefits in terms of monitoring, tracking, controlling and sensing the environment using real time data. Fang et al. introduced the use of IoT to improve environmental monitoring and management tasks [11]. The results from their case study demonstrate that the Integrated Information System (IIS) based on IoT is valuable and efficient for complex tasks in environmental monitoring and management. Ancona et al. highlighted the use of IoT technologies in tackling the complexity in monitoring the flood specifically using rain gauges [12]. IoT provides an interface for data streaming management in real time and at the back end provide data analysis and visualization. In this approach the data collected will be continuously transmitted via the Internet communication infrastructure, to the software components. The software components are designed to compute the stream flow and to quantify the spatial distribution of flood risk for each controlled watershed. Hirabayashi et al. proposed the use of IoT and machine learning based embedded system to predict the probability of floods in a river basin [13].

System Design: (Architecture):



Implementation Details (Modules):

3.1Hardware module

In this project, some hardware is used that are Microcontroller, sensors, components required for power supply. The Hardware collects the water level, Pressure of water, Rainfall measure to detect the levels of the flood. The hardware consists of Wi-Fi enabled controller which connects to the server and allows to share the data to through internet.

1. Microcontroller- This does the controlling with processing . Microcontroller will take the information from the sensor .This information will sent to the admin through the database

2. Sensors-This will collect the information from the particular nodes which are located at certain site. There are four sensors we are going to use in this project.

They are as follows:

Water level measurement: This sensor is used to measure the water level height. For that we are going to use Ultrasonic sensor which emits short, high frequency sound pulses at regular intervals. If they strike an object, then they are reflected back as echo signals to the sensors.

Rainfall measurement: This sensor is used to measure the average rainfall. For that we are going to use same ultrasonic sensor. Ultrasonic sensor is 4 pin sensor. Those are ground connection (GND), Trigger, echo and last current (VCC).

Temperature and Humidity: This sensor is used to measure change in atmospheric temperature and humidity. For this we are using DHT11 sensor which works on one wire protocol and gives digital output. Pressure measurement: This sensor is used to determine the atmospheric pressure. For this we are going to use BMP 180Barometric sensor.

3. Power Supply- In real time we get 230v AC, in actual project we do not need this amount of power supply so we convert this AC power supply to DC power supply.

3.2 Software Module

In this module, we have done an android application as well as the Website application for this project. Admin web page will contain and display the information like Login, Registration, Number of users registered to the app, status of the sensor, safe places near flood affected area where people can migrate and that places are shown on the Map. The Android application will be used by the users who are register. After registration the user can login with aunique username and password. And then user can access all facilities provided by application. Application is provided the information like current status of water level and temperature etc. This app contain map which are show the safe places near the user and also the current place where the user is.

3.3 Database Module:

Microcontroller will send the values measured by the sensors to the server. This will contain the number of users registered to App; this will also show the safe places through the Map. The data uploaded on server is stored on the database. The stored data is then routed to the front end web applications and mobile application

Working of Proposed System:

1. There will be a node as shown in above diagram.

2. This node is the independent flood monitoring node equipped with necessary sensors and connectivity modules.

3. It has three major stages, Including Sensors, Controller, Wi-Fi interface to upload the information on server.

4. Data from various sensors are collected by the ESP and is then computed and uploaded on the server.

5. The data uploaded on server is stored on the database.

6. The stored data is then routed to the front end web applications and mobile applications.

Mimimum Requirement:

1. Software:

* Interactive user interface
* Need database to save data from WSN
* Provide other information such weather forecast
* Provide location map
* Provide communication platform for emergency
* Ease to use all the features

1. Hardware:
2. Real time can detect water increase in three
3. levels.
4. • Can process digital and analog signal into
5. useful information.
6. • Low power consumption
7. • Availability use width range network
8. technology
9. • Scalable can expands network architecture

* NodeMCU ESP8266 12E
* Wifi Module
* Temperature Humidity Sensor
* Ultrasonic Sensor
* Water Flow Sensor
* Water Level Sensor

Application and Future Scope:

1. In flood alert system
2. Municipal Cooperation
3. Fire Department
4. Smart City Management

Future Scope:

The IoT based flood monitoring and detection system is done to save the lives on the people by reducing the human quick out at the emergency conditions. Here the maximum conditions are observed, and the risk alert is provided to the management.

Conclusion:

The success of flood disaster management depends largely on how well flood related data can be collected, managed and utilized. Due to this importance, the use of IoT to facilitate flood data management is seen as a step in the right direction. Many researchers have started to utilize the IoT concept in their work on flood disaster. However, to ensure that all these works that make use of IoT can later be integrated and used together, it is important to have a common architecture that specifies how the different components fit within the larger system and interact with each other. This paper proposed an IoT architecture to serve this purpose. With the proposed architecture, future research works on flood that makes use of IoT will have a reference to specify how the work can fit within the larger flood management system.

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Project Guide Project Coordinator H.O.D.