DAKSH 2020

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COLLEGE : Thiagarajar College of Engineering, Madurai

THEME: Smart Rain Gauge

Problem Statement :

Design/Build a prototype with clear hardware and software specifications that reports the instant weather conditions accurately of a particular location where it is installed, whose data/results can be easily accessed remotely for example through Government set up command or control centers. It should alert the concerned officials in extreme conditions. The prototype should sustain all the weather conditions and the performance should not be affected by the weather. The prototype should be made as cheap as possible.

Proposed Solution:

In most of the urban areas the weather changes occur for a month and the weather was detected by weather monitoring department with the help of some of the expensive devices. But in rural areas people often look at the sky for their weather report instead we came up with new solution which can solve the manual weather prediction method with help of iot sensors. With that value we can able to predict the weather and alert the people in case of extreme weather conditions. The Government can also monitor the weather in the rural areas and alert them and provide shelter in case of flood, tsunami, fire, etc. The correct prediction plays a major role here and manual prediction drops after implantation of this monitoring system. We get accuracy, stability, quick response and quite monitoring system. The data's were stored in database for further reference and research for the prediction.

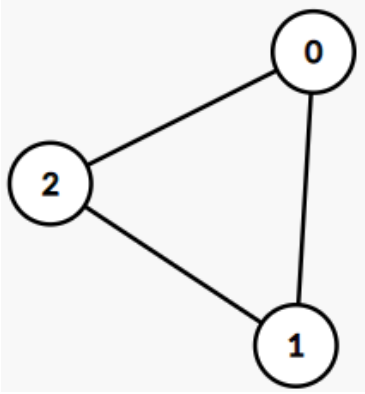
Methodology:

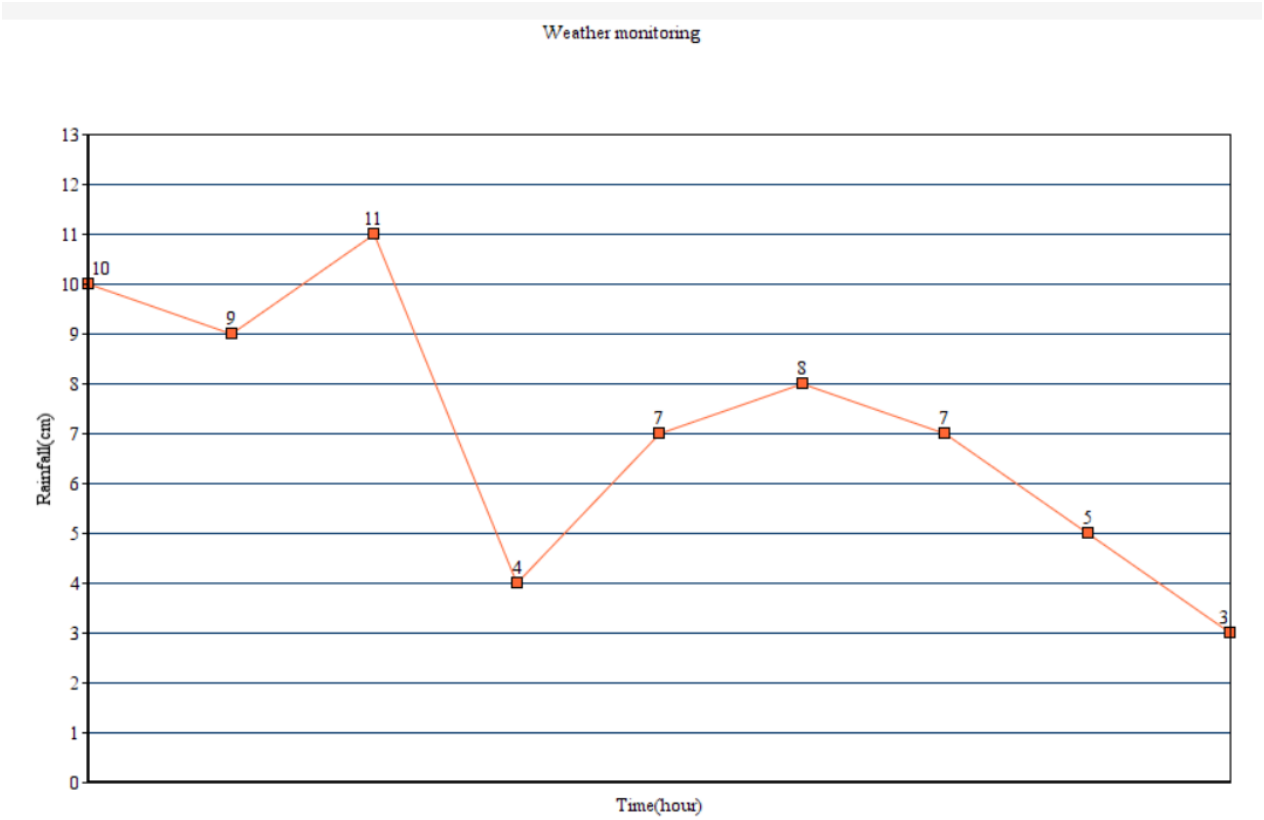
We came with new solution called Smart Rain Gauge, Which no need of human interaction only the sensor read the value as per human assigned logic. First we have to set the location of the sensor at the fixed location. The urban area we took the radius of the area and place 3 sensor at the circular area that is triangular technique as same as cellphone tower which were using current. So that we can able to get the average values and send the accurate data were ever we need. The arduino will take care of find the values and sending to database. Here we use a structured database that is sql (Structured Query Language) this database used to store value and allows you to retrieve data from it. The web site was built with html and database connected using php. We can also list the data change at every

hour to find the variation with the help of graph. The Arduino and Rasberry pi will communicate with the help of Bluetooth to send the data. The Rasberry pi will communicate with the help of wifi or gsm protocols. Even though the signal was not strength enough we can able to send the data in low bit manner.

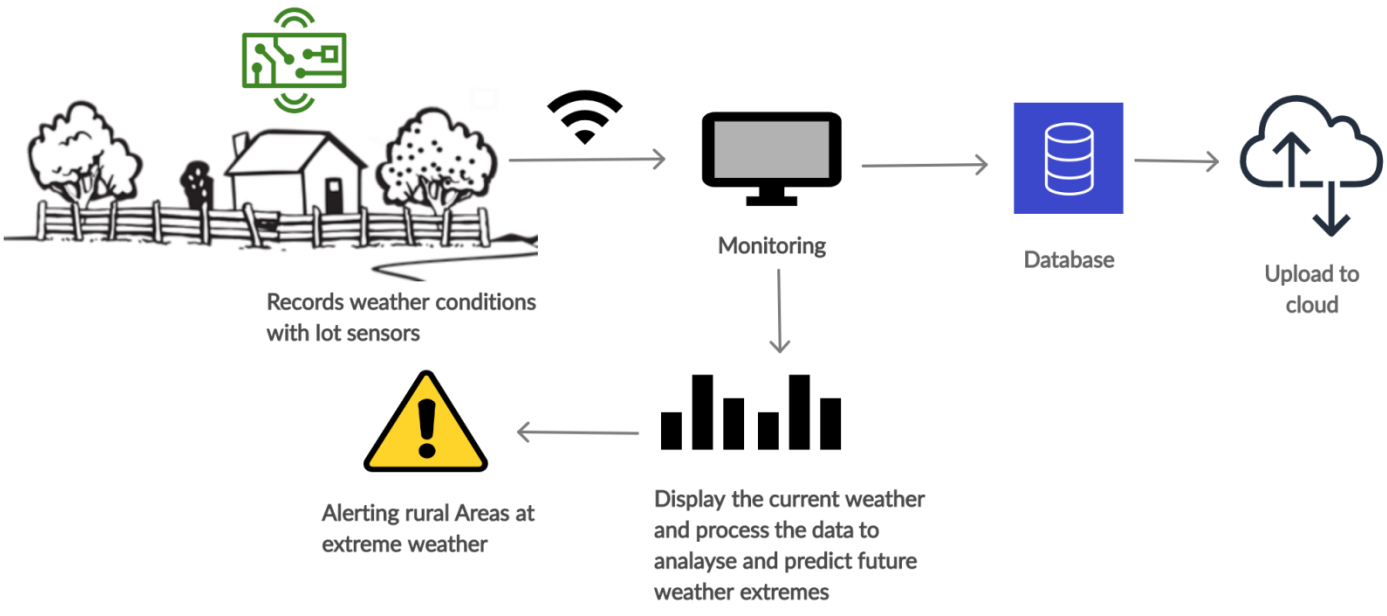
The graphical area of weather indicating the bad condition in red color and average in orange color .

The Node Points were the sensor position





Schematic Diagram:



Constrains:

- **Durability**

The solution can sustain in even in high temperature of 120 C and low at -40 C. The external layer protect it from heavy rain, blizzard, storm and even in very high temperature when inflected in direct sun.Allthough if in case any damage made in sensors or product, immediately reported to authorities.

- **Cost efficient**

Speaking on the cost, its our stronger side and low cost doesn't portrait low quality. It's a mixer of Cheap and Best quality.The regional products are very much cheap to get so that government can implement it very easily not only government all walk of life can afford it for longer benefit

Particulars	Budget(in rupees)
Arduino Uno	300
Lm35	**60**
LDR	**35**
WIFI MODULE	250
MQ2	200
BMP180	150
DC motor	120
Rain Sensor	130
DHT22	300
Other expences	1000
TOTAL	2545(approx.)

- **Accuracy**

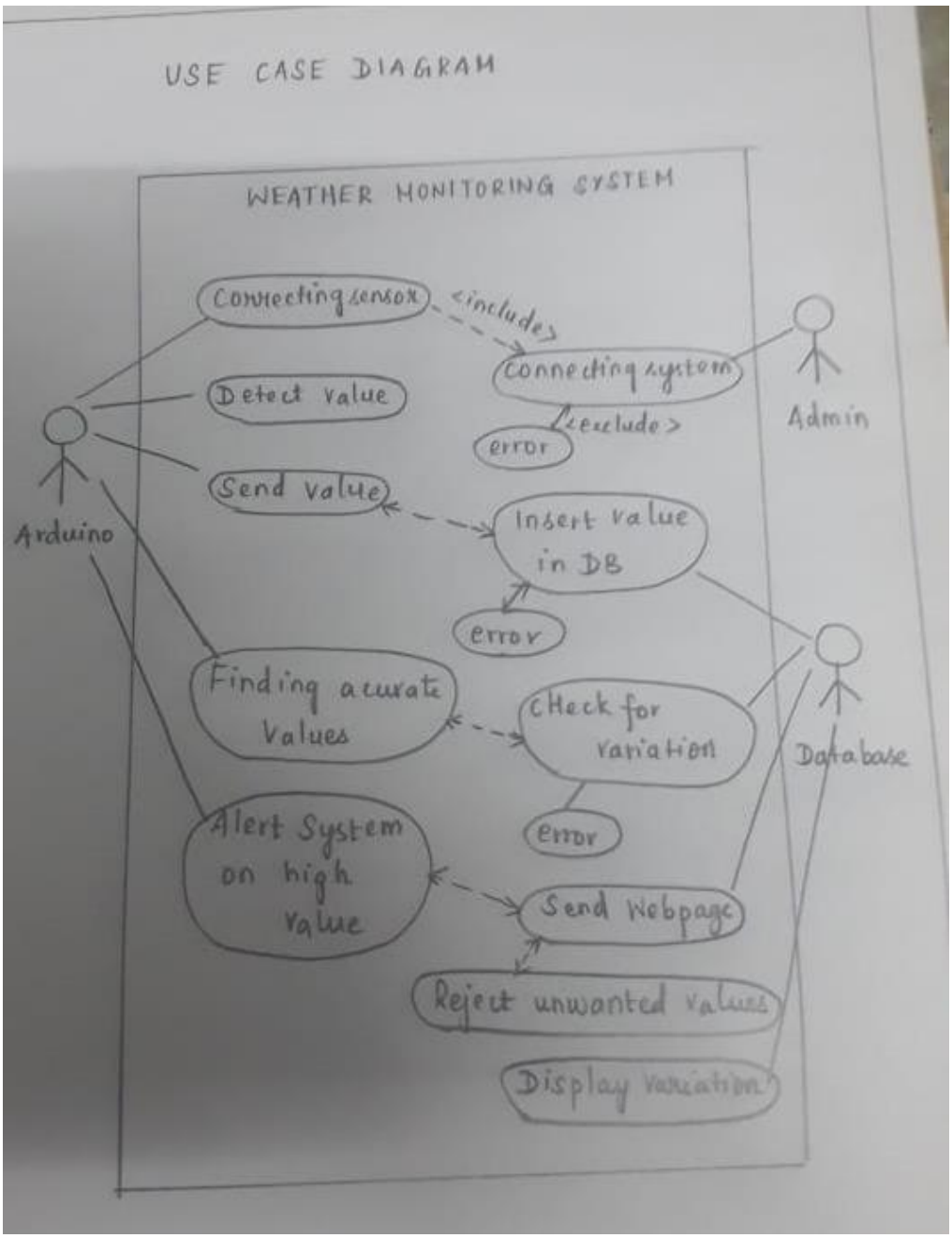
Another predominant part is accuracy the data which collected every 5 minutes is stored and analyzed with weather conditions.The exact data with consistency makes it more accurate and absolute. In some cases, sensors may represent bizarre value the runs our algorithm to predict the best one

- **Connectivity**

  The solution is to be implemented in rural areas where there is poor connectivity we use various protocols to connect to the successful means. If connection is lost the data in stored in internally in the device and synchronized later while get connected

Usecase:

The prototype is being subjected under various natural conditions such as hot summer, low temperature, mist, storm, sand and more. The people interfacing the controlling part becomes very much easier.



Uniqueness:

We have made a unique of alerting the registered and nearby fire team, rescue team and other officials at extreme weather. We also send the location to them so that disaster can be saved before happening.

Technical Stack:

I. HTML
II. Bootstrap 4
III. Javascript
IV. MySQL
V. Php
VI. C Programming for arduino

Conclusion:

Here By I conclude that the weather monitoring and reporting system was developed with the help of sensor and we can able to get instant updates as soon as weather changes. The urban area will be well flourished with the help of this system. The people can work according to the weather.