

1. Introduction

1.1 Overview

My project named Smart Agriculture System is basically the smart irrigation system by the help of which farmer can have control of his/her remote farm land.

1.2 Purpose

When a farmer is away for a while from his/her farm or maybe he/she lives a distance away from the farm, so in that case labour or some extra cost should be employed in order to travel from farm to home and vice versa for irrigation and to take care of plants. So, the purpose of our project is to reduce this extra labour or travel cost and facilitates the farmer to take care of his/her plants' water requirements from his/her remote place.

2. Literature Survey

2.1 Existing Problem

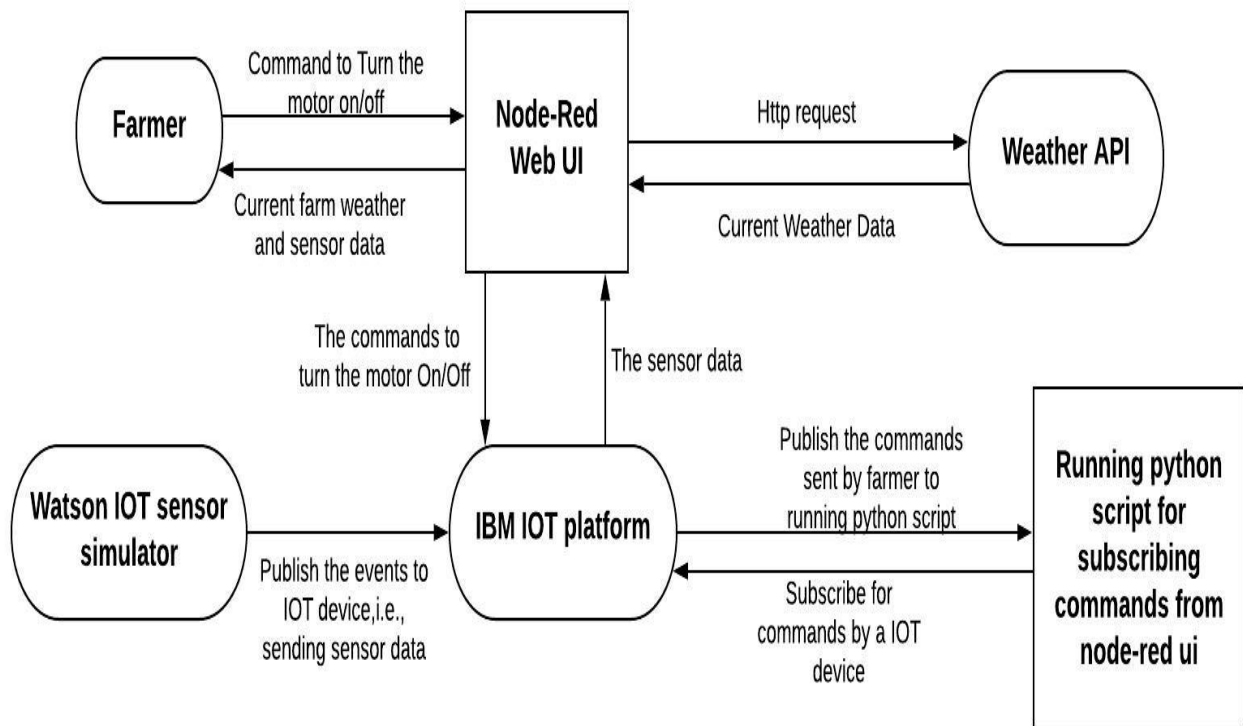
Farmers have to put efforts to know about their plants' water requirements and fulfill it by periodically going to the farm and check it manually. If he forget to check or water the plants, this may damage his/her crops and all the efforts put up on cultivation of crops will go in vain.

2.2 Proposed Solution

With the help of this web application, farmer can observe the farm land weather conditions and soil moisture with the comfort of his home thereby reducing the amount of efforts. In addition to it, he can set the threshold values of the atmospheric or soil conditions in order to get notified. He can also control the motors to irrigate plants from the remote place.

3. Theoretical Analysis

3.1 Block Diagram



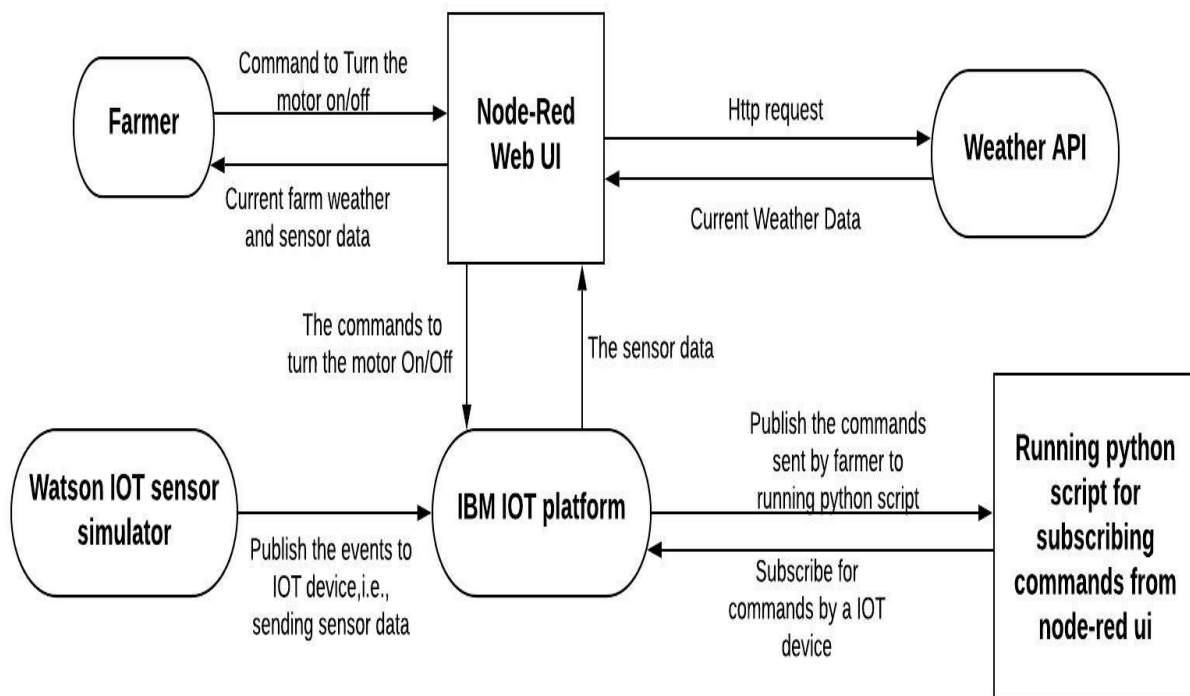
3.2 Hardware/Software designing

This is a web application based on node-red which uses javascript as its back end. Here, the user/farmer can interact with the web application which can inform the farmer about the sensor data recieved by the IBM IOT platform device. The Watson IOT sensor simulator is responsible for sending the sensor data. The node-red UI will also show the weather data of the farm returned by the Openweather API. The farmer can set threshold value of temperature so that when the sensed temperature by simulator is greater than or equal to threshold temperature, a notification will be displayed in the node-red UI. The farmer can turn On/Off the motors for irrigating plants from a remote place.

4. Experimental Investigations

- Check whether the commands of switching motors ON/OFF are recieved by the motor or not.
- Find out the essential weather parameters which impact the plants.
- Check whether the notification displays as soon as temperature reaches the threshold or not.

5.Flowchart



6. Result

The node-red application which will interact with the farmer and inform the farmer about the weather conditions of his/her farm and also the sensors' data. The application will notify the farmer when the temperature is above the threshold and he will be able to control the water motors accordingly from a place remotely situated to the farm.

7. Advantages and Disadvantages:

Advantages:

- It would reduce farmers' efforts and save his/her time and money.
- It would reduce the wastage of water.
- It would fetch the accurate data to take decisions.
- It would notify farmer in case, if he forgot.

Disadvantages:

- The farmers face difficulty in manually interpreting this sensor data and taking decisions.
- The lack of intelligence in the system which cannot tell the farmer the right time to turn ON/OFF the motor automatically.
- The lack of knowledge of farmers due to which they cannot understand the weather parameters and their values.

8. Applications:

It can be used to develop a system which automatically fulfills the plants' requirements by watering the plants with specific quantity for a specific time based on the current and forecasted weather data.

9. Conclusion:

IoT based SMART AGRICULTURE SYSTEM for Live Monitoring of Temperature and Soil Moisture has been proposed using Arduino and Cloud Computing . The System has high efficiency and accuracy in fetching the live data of temperature and soil moisture. The IoT based smart farming. System being proposed via this report will assist farmers in increasing the agriculture yield and take efficient care of food production as the System will always provide helping hand to farmers for getting accurate live feed of environmental temperature and soil moisture with more than 99% accurate results.

10. Future Scope:

Future scope would be focussed on developing a AI-enabled system which will able to predict amount of water required by a specific crop for a particular period of time. This system will automatically control the irrigation system accordingly without the involvement of farmer. Also, sensors in the farm can be increased in order to ensure Pest control so that the crop produce is not damaged.

11. Bibliography:

- discourse.nodered.org
- www.wikipedia.org
- www.youtube.com
- cloud.ibm.com
- openweathermap.org