**1.INTRODUCTION**

* 1. **Overview:**

This project aims to develop a smart irrigation system that automatically controls the flow of water, taking the state of the soils moisture level and temperature into consideration. Traditional irrigation systems may cause either over or under-watering, both of which are harmful to plants and may cause plant death. Also, overwatering is a waste of water. The inefficiency of such systems comes from the difficulty of knowing whether a plant has sufficient water or not. The reason is that these traditional systems run at specific periods considering fixed conditions and settings. Therefore, there is a need for a smart irrigation system that considers the real time conditions of the weather and soil, and then adjusts the watering process to the actual conditions of the site. This system enhances the efficiency of water consumption and plant life.

* 1. **Purpose:**

The purposes of our smart water irrigation system are to provide a water delivering schedule to the crops to ensure all the crops have enough water for their healthy growth, to reduce the amount of water wasted in irrigation, and to minimize the economic cost for the users.

**2. LITERATURE SURVEY**

2.1 **Existing Problem:**

Irrigation assumes water will be distributed over the soil, often by sprinklers, and sometimes by drip systems or surface flows. Water traveling over soil will result in erosion. The displacement of the top soil has impacts of various natures. When soil is displaced but remains in the field, the impact is low.

2.2 **Proposed Solution:**

In this proposed system we are using various sensors like temperature, humidity, soil moisture sensors which senses the various parameters of the soil and based on soil moisture value land gets automatically irrigated by ON/OFF of the motor.

**3. THEORITICAL ANALYSIS**

**Software designing:**

{experiment programming}

import time

import sys

import ibmiotf.application

import ibmiotf.device

import random

import urllib.request

import json

import requests

#Provide your IBM Watson Device Credentials

organization = "pp2pfs"

deviceType = "windows"

deviceId = "12345678"

authMethod = "token"

authToken = "123456789"

def myCommandCallback(cmd):

print("Command received: %s" % cmd.data)#Commands

try:

deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method": authMethod, "auth-token": authToken}

deviceCli = ibmiotf.device.Client(deviceOptions)

#..............................................

except Exception as e:

print("Caught exception connecting device: %s" % str(e))

sys.exit()

# Connect and send a datapoint "hello" with value "world" into the cloud as an event of type "greeting" 10 times

deviceCli.connect()

while True:

r=urllib.request.urlopen('https://samples.openweathermap.org/data/2.5/weather?q=London,uk&appid=439d4b804bc8187953eb36d2a8c26a02')

s=r.read()

q=json.loads(s)

temp=q['main']['temp']

hum=q['main']['humidity']

data = { 'Temperature' : temp, 'Humidity': hum }

soil=random.randrange(0,1023)

if (soil<=200):

url = "https://www.fast2sms.com/dev/bulk"

querystring = {"authorization":"ovKnyhewuJSIFWQZlji2zR8sm0qPDctOEg4rC73BLNA5d1HXVUHDfdjCprMFzxeoZakNn6O9uYW3LP54","sender\_id":"FSTSMS","message":"turn on motor","language":"english","route":"p","numbers":"9963607462"}

headers = {

'cache-control': "no-cache"

}

response = requests.request("GET", url, headers=headers, params=querystring)

print(response.text)

data = { 'Temperature' : temp, 'Humidity': hum,'Moisture':soil}

def myOnPublishCallback():

print ("Published Temperature = %s C" % temp, "Humidity = %s " % hum,"Moisture=%s %% "%soil, "to IBM Watson")

success = deviceCli.publishEvent("Weather", "json", data, qos=0, on\_publish=myOnPublishCallback)

if not success:

print("Not connected to IoTF")

time.sleep(2)

deviceCli.commandCallback = myCommandCallback

# Disconnect the device and application from the cloud

deviceCli.disconnect()

{service credentials}

API Key:[a-pp2pfs-hilklj973n]

Authentication token:[X(2rx-C10xgVrDqsp(]

**4. EXPERIMENTAL INVESTIGATION**

Climate change because of the greenhouse effect has been authenticated. Fallouts like the

2015 Chennai floods suggest techniques like precision agriculture that includes automation

in the irrigation system are important. This paper suggests an economical and easy-to-use

Based on investigation and applications in precision agriculture,

a self-designed moisturewireless … In our experiments, when soil mass moisture content is below 25%,

The results show that the smart irrigation control system is practically water-saving

The UI in the Android smart phone allows the user easy remote control of the irrigation drive system

that involves switching, on and off, of the drive motor based on commands from the android smart phone

Studies conducted on a laboratory prototype suggest that the design is viable and can be easily

adopted for real time application.

**5 .FLOW CHART:**

**Connecting to MIT app**

**Connecting to Node Red**

**Connecting python code to IOT device**

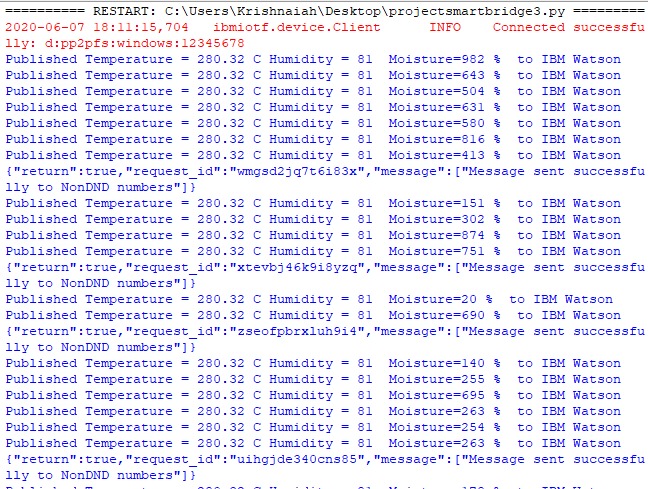
**If(soil moisture<500)**

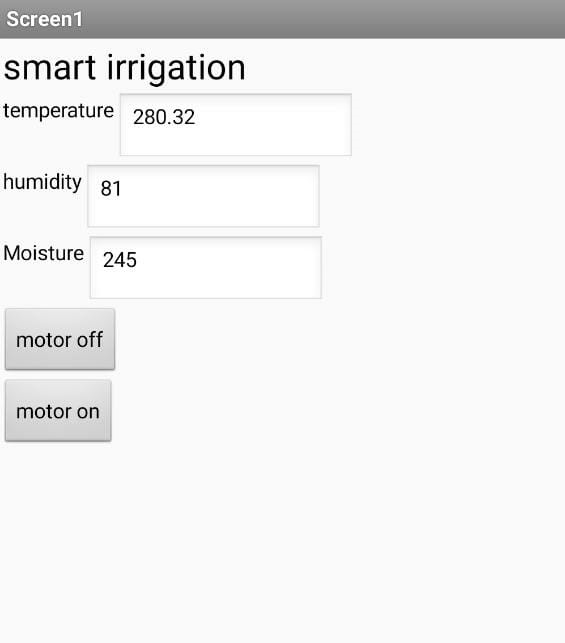
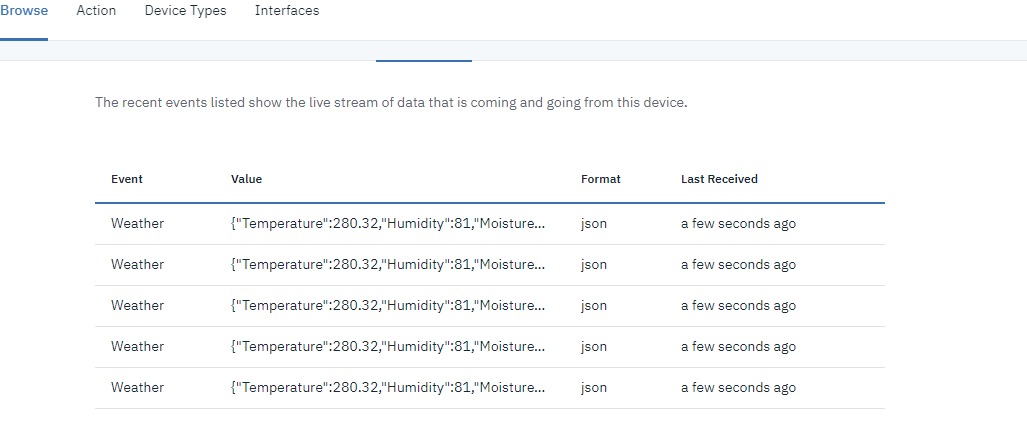
**“turn on motor” message will be sent to the user using fast sms**

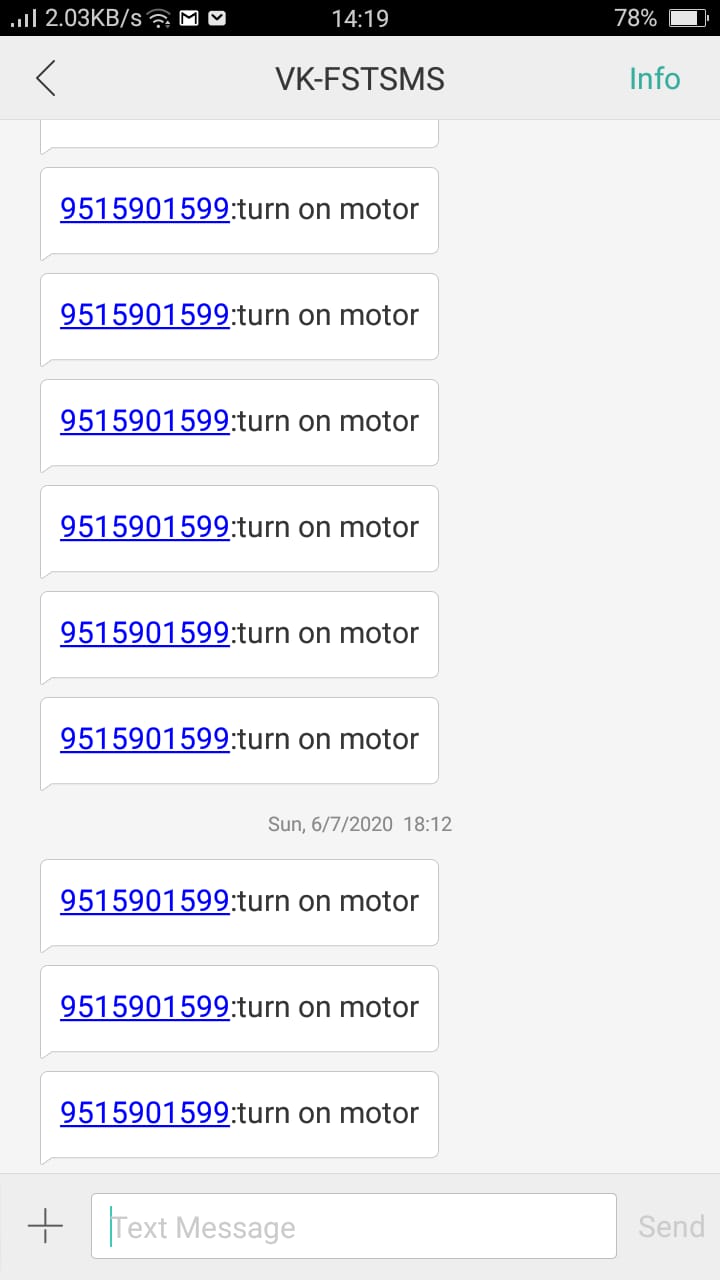
**Extracting temperature and humidity values from weather url**

**Creating IOT device using IBM cloud**

**Producing soil moisture values using random value functions**

**6. RESULT :**

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7.ADVANTAGES:

One of the most obvious advantages is the time savings afforded by an automatic sprinkler or drip irrigation system. Once installed, many systems can be set to a timer to water at specific time intervals and on certain days of the week. This means there's no need to worry about forgetting to water the lawn and coming back from vacation to find crisp, yellow grass.

Another advantage is that irrigation systems, particularly the drip type, can be positioned so that water is more effectively targeted where it is needed. Nozzles can be adjusted, and underground drip tubes will deliver water right to the roots, rather than spraying walkways and driveways.

Another advantage is that automatic irrigation systems are generally hidden from view, which means there are no unsightly hoses stretched across the lawn and no more tripping hazards. Sprinkler heads pop up to spray and then retract when the job is done. Underground drip systems do their work out of view. For families with young children and pets who share outdoor spaces, automatic systems may be a safer option.

**7. DISADVANTAGES :**

The primary disadvantage associated with a sprinkler system is the expense. These systems can be quite costly depending on the size of the property. Furthermore, portions of the lawn will have to be dug up to install pipework and attach it to the plumbing system of the home. This can equate to days or weeks without use of the yard. Afterward, the landscaping will have to be repaired.

It is best to install an irrigation system before installing sod or extensive landscaping because some of it will have to be torn up. Homeowners who already have pristine yards may be turned off by this reality.

Even the most efficient sprinkler systems can have their pitfalls. Wind can wreak havoc on sprinklers, directing water in the wrong direction. Underground pests may damage water-delivery systems, resulting in water pooling or broken parts. The repairs to fix an irrigation system can be much more costly than replacing a damaged garden hose.

**8. CONCULSION :**

This paper involves establishing a contemporary design technique of monitoring and controlling the moisture level of soil using LabVIEW. Providing comprehensive tools that need to build any measurement or control application in dramatically less time. The project also includes rain sensor, which is very important in the project to avoid unnecessary power wastage. No longer only are farmers able to generally use much less water to grow a crop, they're able to increase growth yields and the satisfactory of the crop by using better management of soil moisture at some point of vital plant growth degrees. Embedded system for computerized irrigation of an agriculture subject gives an able solution to assist web page- precise irrigation control that permits producers to maximize their productivity whilst saving the water.

**9. FUTURE SCOPE :**

We can interface LCD screen in order to display the current status of the soil moisture content levels, percentage of water utilized to water the plant, duration of time for which the water pump is ON, etc. We can also show the graphical representation of the moisture content levels in the soil. To improve the efficiency and effectiveness of the system, the following recommendations can be put into consideration. Option of controlling the water pump can be given to the farmer. The farmer may choose to stop the growth of crops or the crops may get damaged due to adverse weather conditions. In such cases farmer may need to stop the system remotely.The idea of using IOT for irrigation can be extended further to other activities in farming such as cattle management, fire detection and climate control. This would minimize human intervention in farming activities.

**10. BIBILORAPHY :**

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