PROJECT REPORT

IOT APPLICATION DEVELOPER

TITLE: Smart Agriculture system based on IoT

DONE BY:

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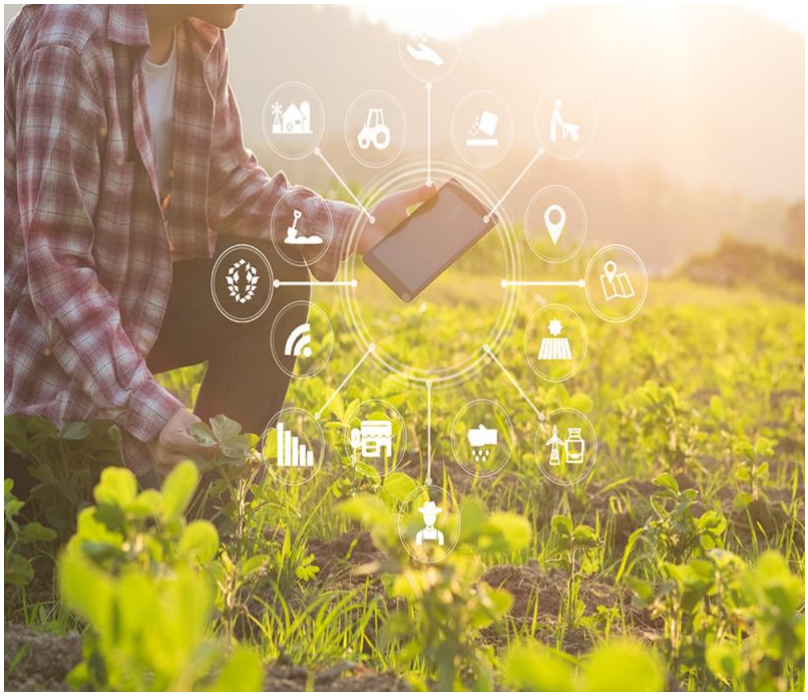
Project ID:SPS_PRO_101

Internship company:smartinternz



ABSTRACT:

In India, about *11.8 crore* farmer is living in various states across the country, Since the industrial revolution has upgraded a lot of the fields it also brought a huge impact in the agricultural field . But in developing countries like India, the agricultural field has not achieved its considerable momentum. There are about *296,438* Indian farmers had committed suicide since *1995*. Inorder to bring in the required momentum (INTERNET OF THINGS) IOT a very handy technology will help to boost up the agricultural industry with an intelligent application designed to advise the farmers about the climatic

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INTRODUCTION:

1. OVERVIEW:

Digital agriculture refers to tools that digitally collect, store, analyze, and share electronic data and/or information along the agricultural value chain. Digital technology changes economic activity by lowering the costs of replicating, transporting, tracking, verifying, and searching for data. Due to these falling costs, digital technology will improve efficiency throughout the agricultural value chain. The proposed system enables the farmer with the climatic data and helps them to control the motor with the internet.

2.OUTCOME**:**

- The digital platform provides the climatic data by which farmer can understand the climate in an efficient way
- Field data to understand the crop in an efficient way
- Motors can be controlled with this digital platform so that farmer can control motors from anywhere.

3.Scope of work:

- A device being created from IBM Account.
- Install Node-RED
- get the API key from openwheather.org
- Application (.apk) created for user interaction

PROBLEM AND SOLUTION:

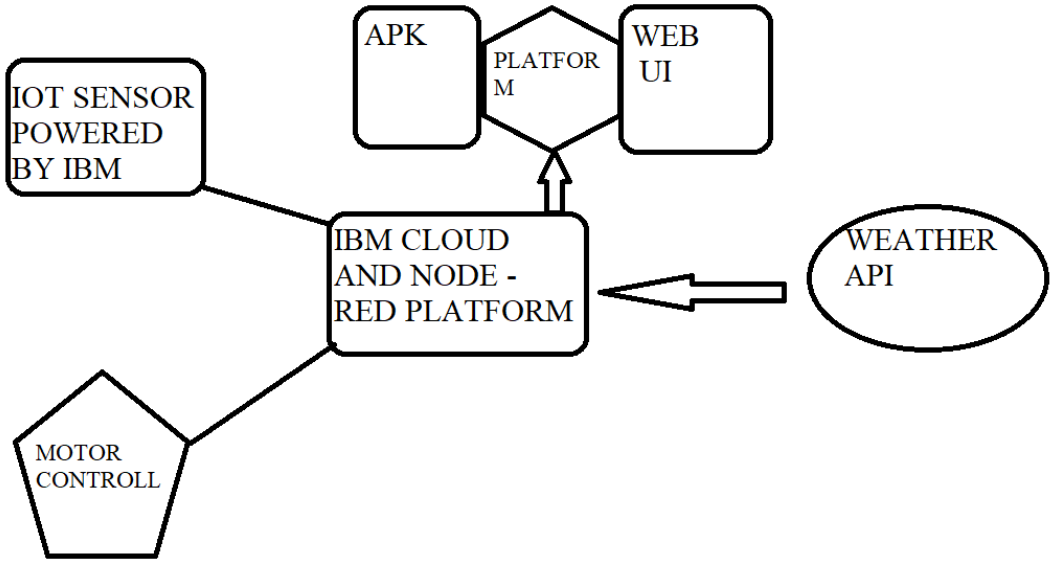
1.EXISTING PROBLEM:

- Lack of weather forecasting knowledge
- Lack of agricultural field understanding
- Inefficient usage of water
- Lack of advice about the specific field

2.Solution:

- Digital platform with integrated sensor data
- User interaction to know about the field data
- Climatic forecasting
- Enables the motor controlling through the power of the internet

Diagramatic Sketch:



SKILL AND TOOLS:

1. SKILLS REQUIRED:
   - IOT Application Development
   - IBM cloud
   - Node-red platform

2.TOOLS:

- IBM Cloud to integrate the data
- Iot simulator
- Digital platform android and web UI to view the data and outcome
- Weather forecasting API integrated with apk

CODE :

1.NODE-RED FLOW: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            "hidden":false
          }
        ]
```

2. PYTHON CODE :

Python code is used to send the command about the motor on/off

```
import time
import sys
import ibmiotf.application
import ibmiotf.device

# Provide your IBM Watson Device Credentials
organization = "o9hvpe"  #  organization ID
deviceType = "controllerdata"  # device type
deviceId = "0001"  #  device id
authMethod = "token"
authToken = "8072958226"  #  token


def myCommandCallback(cmd):
    print("Command received: %s" % cmd.data)
    if cmd.data['command'] == 'motor_on':
        print("MOTOR ON")
    elif cmd.data['command'] == 'motor_off':
        print("MOTOR OFF")


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()

deviceCli.connect()

while True:
    T = 59;
    H = 51;
    O = 2;


    data = {'d':{'temperature': T, 'humidity':
H,'objectTemp':O,}}


    # print data
    def myOnPublishCallback():
        print("Published Temperature = %s C" % T,
"Humidity = %s %%" % H, "objectTemp = %s C" %O
,"to IBM Watson")


    success = deviceCli.publishEvent("event", "json", data,
qos=0, on_publish=myOnPublishCallback)
    if not success:
```

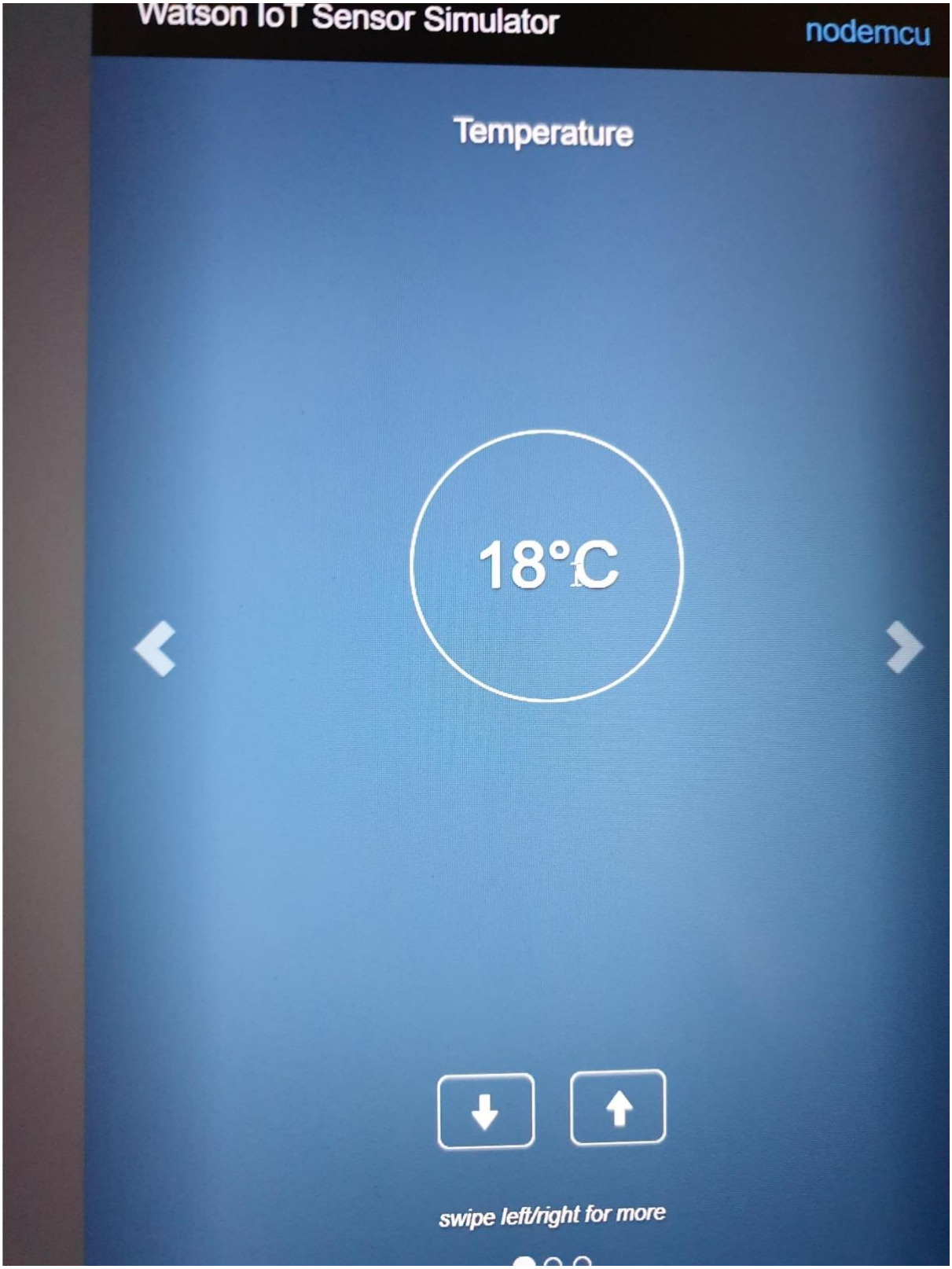
```
        print("Not connected to IoTF")
    time.sleep(1)

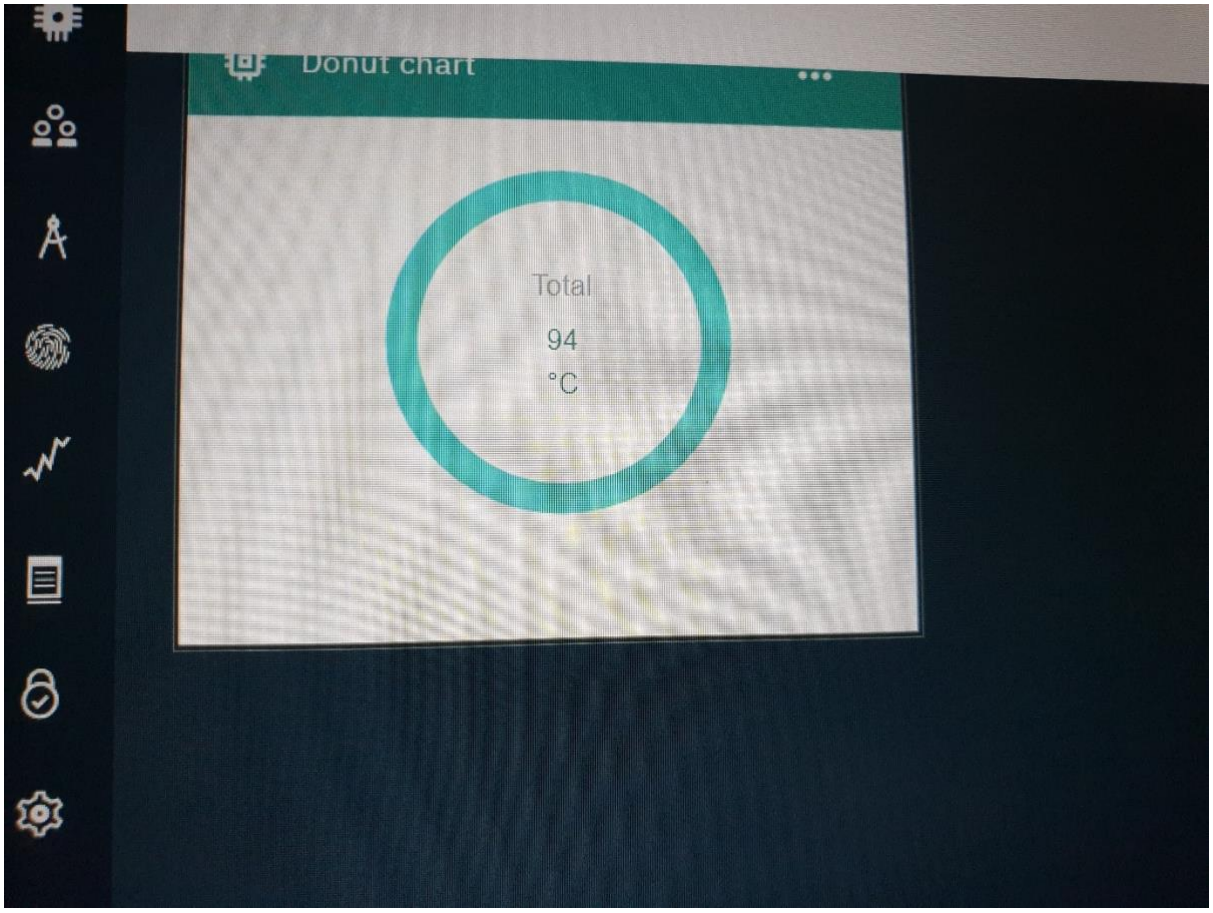
    deviceCli.commandCallback = myCommandCallback

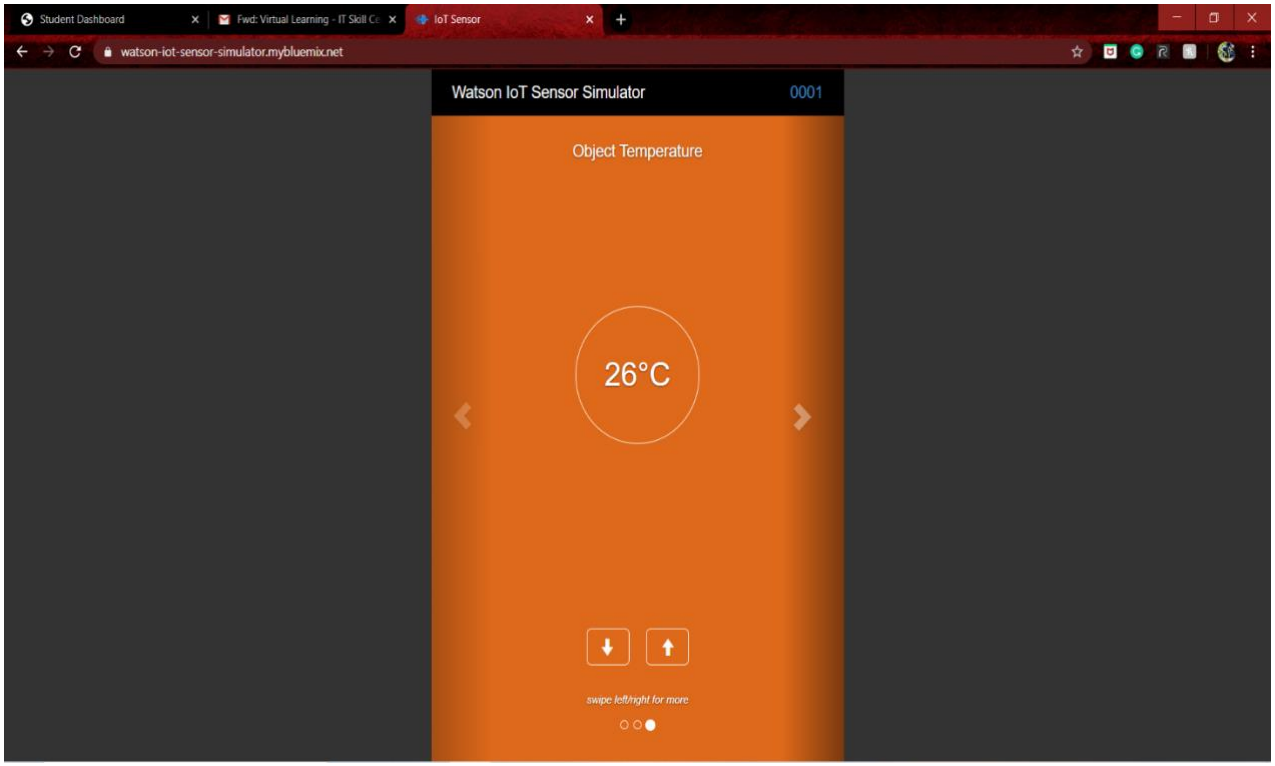

deviceCli.disconnect()
```

OUTPUT:

1.IOT SENSORS:


Watson IoT Sensor Simulator
nodemcu
Temperature
18°C
swipe left/right for more


Donut chart
Total
94
°C


Student Dashboard
Fwd: Virtual Learning - IT Skill Ce
IoT Sensor
watson-iot-sensor-simulator.mybluemix.net
Watson IoT Sensor Simulator
0001
Object Temperature
26°C
swipe left/right for more

ANDROID APP:

TEMPERATURE: 59

HUMIDITY: 51

OBJECT TEMPERATURE 2

MOTOR OFF **MOTOR ON**

CLIMATE UPDATE

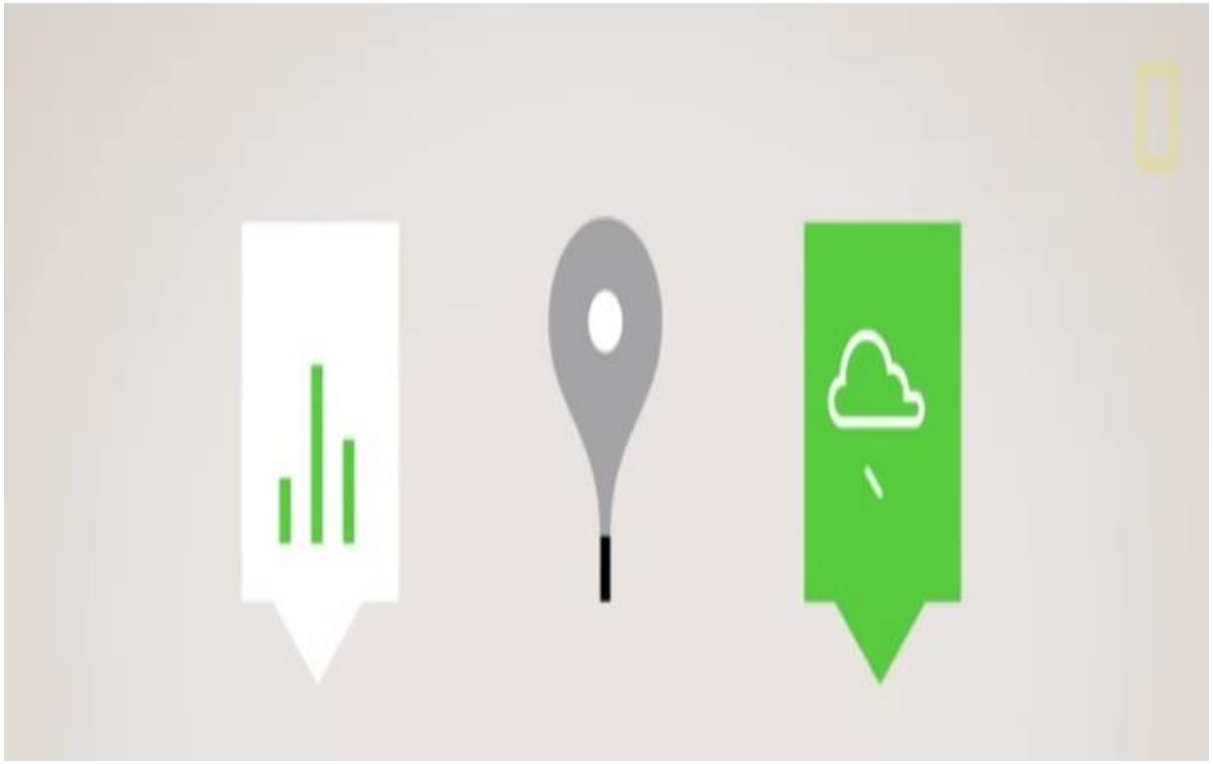
ADVANTAGES OF DIGITAL AGRICULTURE:

1. Monitor Soil & Plant Parameters

2. Automate Field Management

3. Collect Real-Time Data

4. Get the Best Results From Labor & Resources



ENTER LOCATION: Mumbai

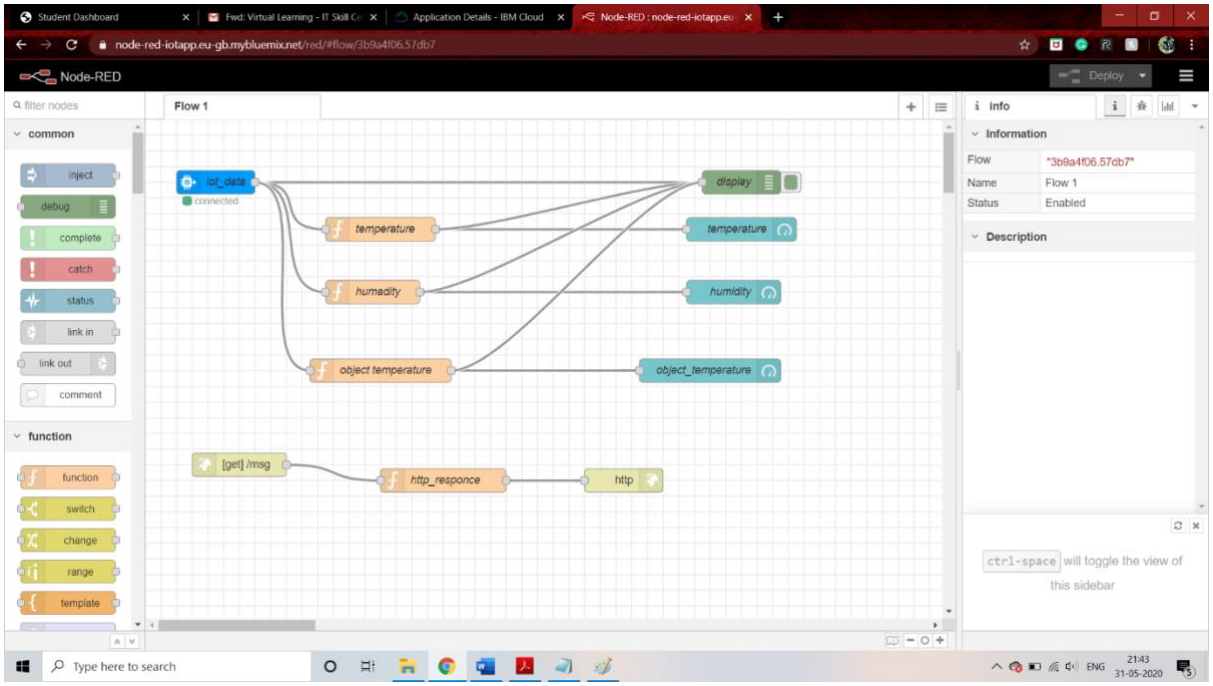
GET CLIMATE UPDATE

DESCRIPTION : *haze*

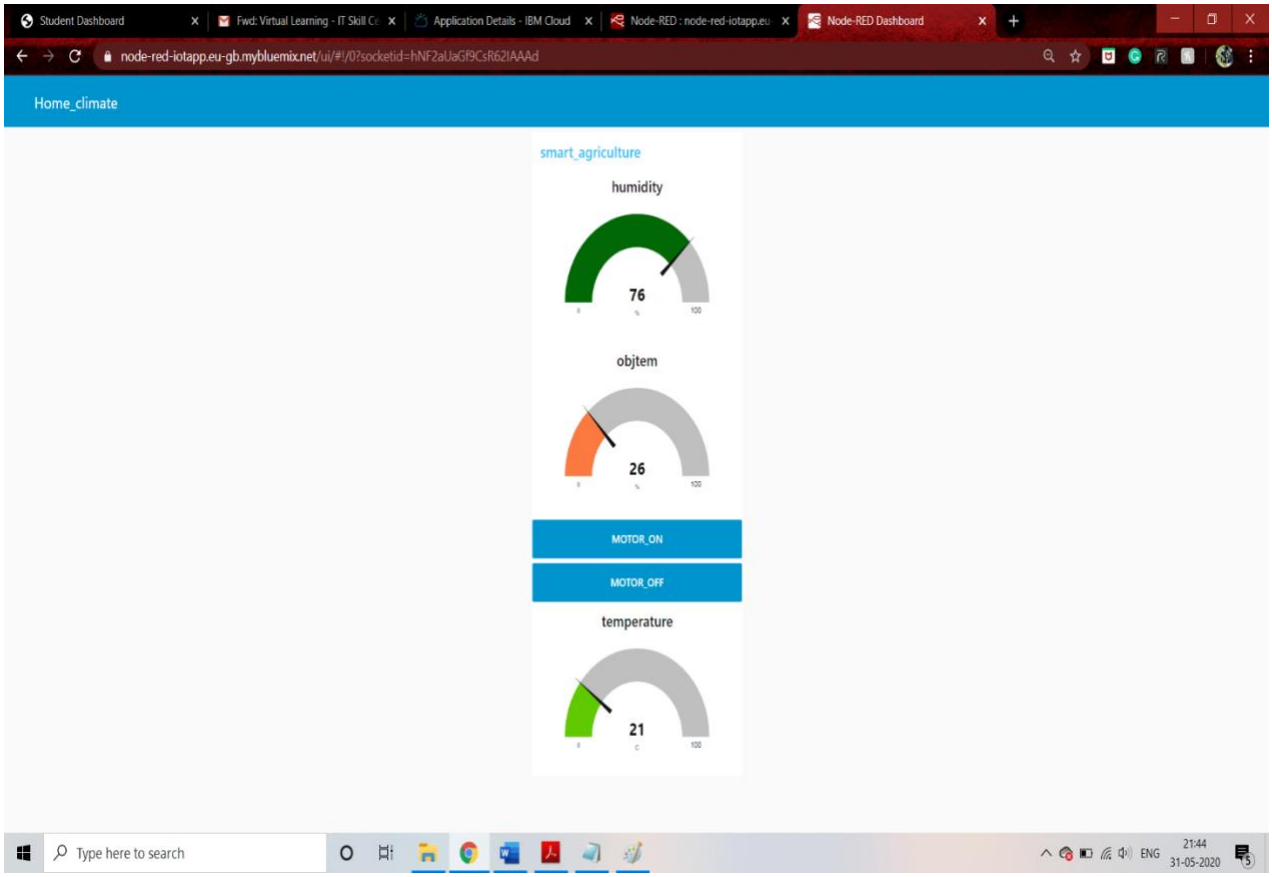
TEMPERATURE : *305.15*

WIND SPEED : *5.1*

NODE – RED FLOW:



WEB UI:



ADVANTAGES:

- Digital platform advice the farmer to know about the weather
- Data from agriculture field are displayed in the platform
- The motor on/off can be done in the platform

URL LINKS :

1.For web UI: https://node-red-iotapp.eu-gb.mybluemix.net/ui/#!/0?socketid=hNF2aUaGf9CsR62IAAAd

2.Node editor: https://node-red-iotapp.eu-gb.mybluemix.net/red/#flow/3b9a4f06.57db7

3.Weather api: https://openweathermap.org/api

3.Android apk: https://drive.google.com/open?id=1WEb0jl6FrOkvAMiRkJqK9MdP5gk6p_mD