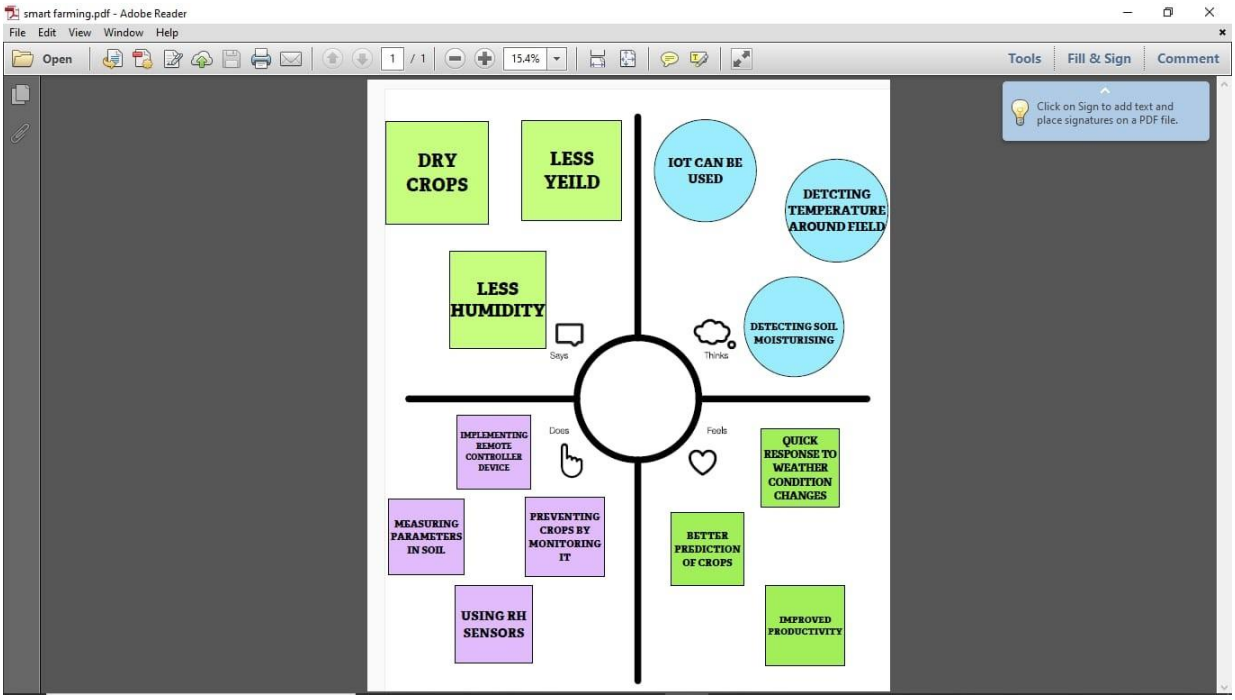
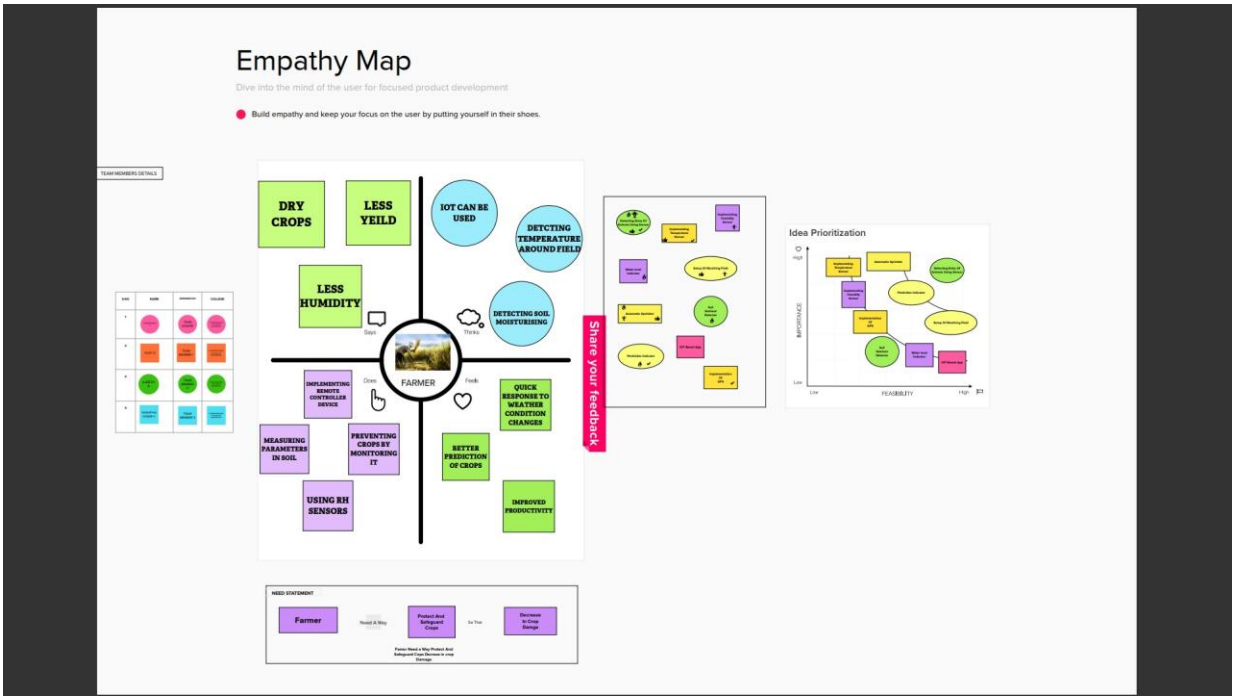
Team ID	PNT2022TMID11808
Team Leader	Tharun Raj T R
Team Member	Ranjith V
Team Member	Shailesh Kanna R
Team Member	Mohith M

IDEATION:





LITERATURE SURVEY:

SMARTFARMER -IOT ENABLE SMART FARMING APPLICATION TEAM MEMBERS: -

Thaun Raj TR

Ranjith V

Shailesh Kanna R

Mohith M

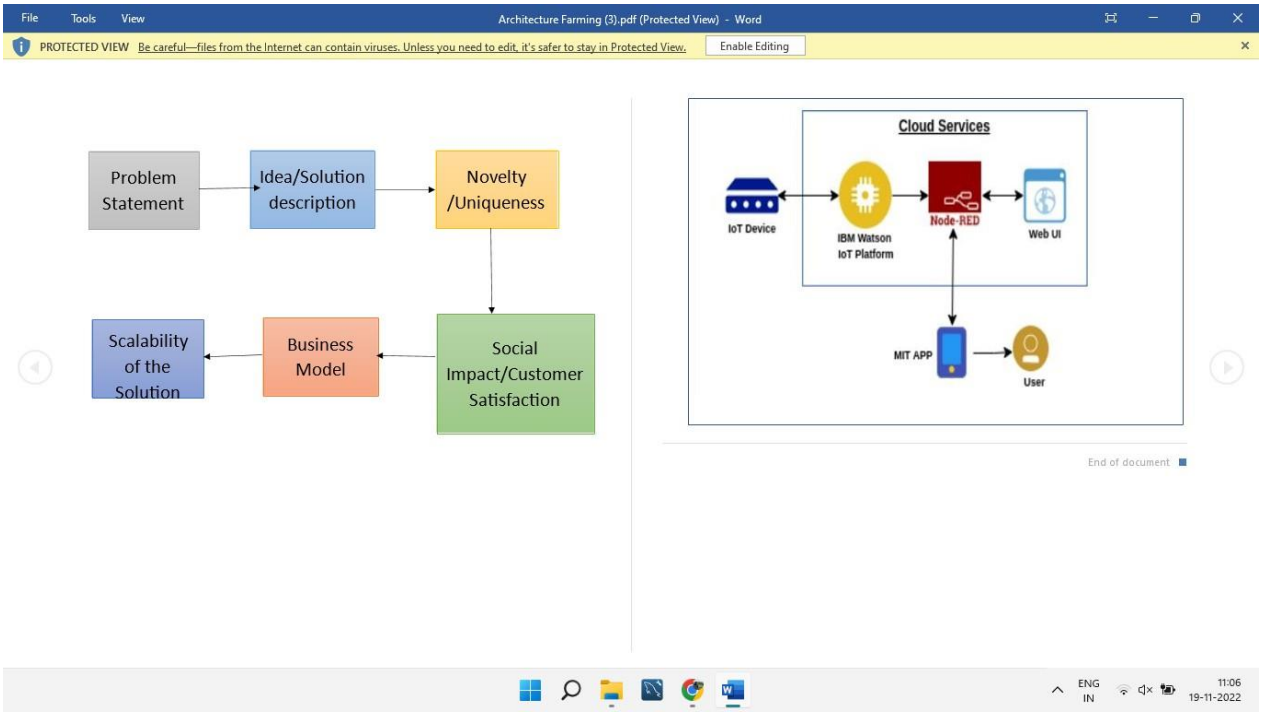
A LITERATURE SURVEY: - Harendra Singh Negi Published on" International Journal of Engineering and advanced technology 2022". India's rural and urban areas share a number of agricultural concerns, necessitating coordinated efforts to address these issues, which asks for unquestionably comparative solutions. The goal of this concept is to examine the potential of IoT technologies in relation to poverty in these areas, in addition to the established requirements in these commodities and with emphasis on agriculture. This study examines internet-of-things sample data to alter regional farming preferences for specific commodities in order to increaseyield production. In India, the majority of the population relies on agriculture, and a sizable portion of the country's income comes from it. For our nation, which depends on imports, automating the agricultural process is one of the most important tasks. C K Gomathy Published on "International Journal of Scientific Research in Engineering and Management 2022" With everything becoming smart and connected, the Internet of Things touches every aspect of the lives of the average person. The term "internet of things" describes a network of autonomouslyconfiguring objects. The basic goal of smart farming is to increase agricultural output while using less resources and less labour. The development of internet of things (IoT)-based gadgets

for thinking smart farming is changing the face of agricultural output on a daily basis by not only improving it but also making it more efficient and cutting waste. Forecast data indicates that the global population will grow by 25% by 2050 compared to the current population. Since we would have twice as much food as before, crop production should rise. Dinesh Varma Kanumri Published on “Bournemouth University 2020” With the aid of technology, the agriculture sector has advanced significantly, becoming more data-driven and intelligent. Agriculture was among many industries that underwent radical change as a result of the Internet of Things' quick development. Such a major transformation destroys current farming methods and generates new opportunities as well as some difficulties. In this article, the potential of wireless sensors and IoT in agriculture is highlighted. Additionally, some difficulties are anticipated when integrating this approach with conventional farming practises. Indepth explanations are provided for the IoT tools and methods utilised in farm applications. We can recognise contemporary IoT trends in agriculture based on this article. Ritika Srivastava Published on “Krishna Engineering College 2020”IOT sensors have the ability to provide information about agricultural fields and subsequently take action based on user input, making smart agriculture an emerging concept. The feature of this study is the creation of a system that uses sensors and an Arduino UNO board to monitor temperature, moisture levels, water levels, and even movement in the field that could harm crops. IOT sensors have the ability to provide information about agricultural fields and subsequently take action based on user input, making smart agriculture an emerging concept. The initiative attempts to utilise smart agriculture using automation and emerging technology, such as IOT. As requirements and technology change after hardware development, it is necessary to update the software. The new version of the programme refers to the changed hardware. Jash Doshi Published on “Pandit Deendayal Petroleum University, Gandhinagar 2019” Every area will be impacted by the Internet of Things (IoT) in the future since it will make everything sentient, which will affect everyone's daily lives. It is a network made up of many devices that can configure itself. The use of IoT in Smart Farming is changing the face of traditional agricultural practises by making them more cost-effective for farmers and lowering crop loss in addition to optimising them. The goal is to suggest a piece of technology that can send messages to farmers across many platforms. The solution will help farmers by providing them with real-time data from the farms (temperature, humidity, soil moisture, UV index, and IR) so they can take the necessary actions to practise smart farming while also enhancing crop yields and conserving resources (water, fertilizers). M P Jyothi Published on “International Conference on Recent Advances in Electronics and Communication Technology in 2017” IoT, or the Internet of Things, is essential to smart agriculture. Because IoT sensors may provide information about their agricultural fields, smart farming is a new concept. The goal of the article is to use IoT and smart agriculture using emerging technology. The main component to increase the production of productive crops is to monitor environmental conditions. This paper's feature involves employing CC3200 single chip-based sensors to monitor the temperature and humidity in agricultural fields. The camera is connected to the CC3200 so that pictures can be taken and sent through MMS to the farmers' mobile devices over Wi-Fi. Aditi Mehta Published on” Department of information Technology 2016” There is

tremendous growth potential for the embedded business. Additionally, the way ahead is becoming more obvious every day. It's time for us to begin developing IOT solutions and offeringvalue to our clients. By 2020, the IoT is anticipated to connect 28 billion things to the internet, including industrial machinery, autos, appliances, and wearable technology like smart watches. The development of an agricultural nation depends heavily on agriculture. In India, around 70% of the population is dependent on agriculture, and this industry generates onethird of the country's GDP. Agriculture-related issues have historically impeded the nation's progress.

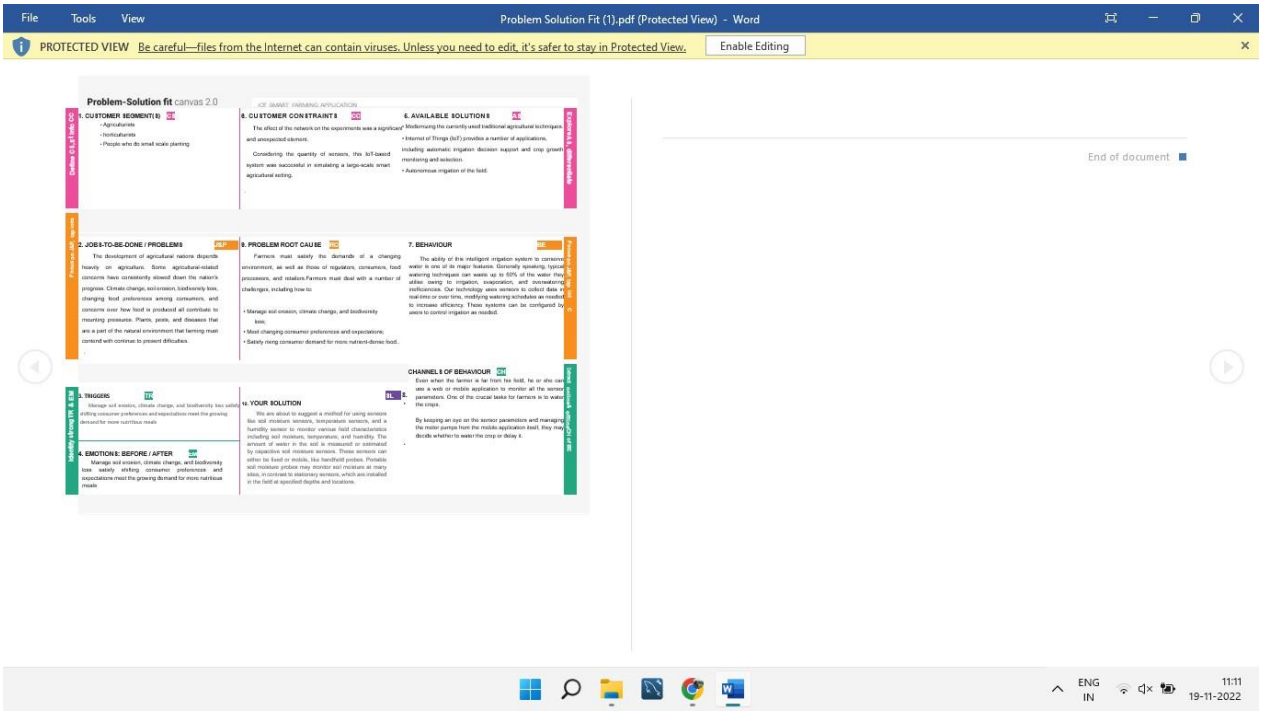
Modernizing the current traditional methods of agriculture is the only way to solve this issue. Zahair Ahamad Published on ", Rayalaseema University in 2018" Unmanned Aerial Vehicles arewhat are known as drones (UAVs). In other terms, drones are flying objects that may be remotely or autonomously programmed, either by a ground station or a remote control. robotic technologies on a network. Sadly, drones haven't significantly changed farming techniques, atleast not yet. Up to now. Recently, there has been a lot of activity on the use of drones in agriculture and precision farming. In order to reduce the cost of production, considerable technologies have been created to automate agriculture.

PROJECT DESIGN PHASE-I
ARCHITECTURE

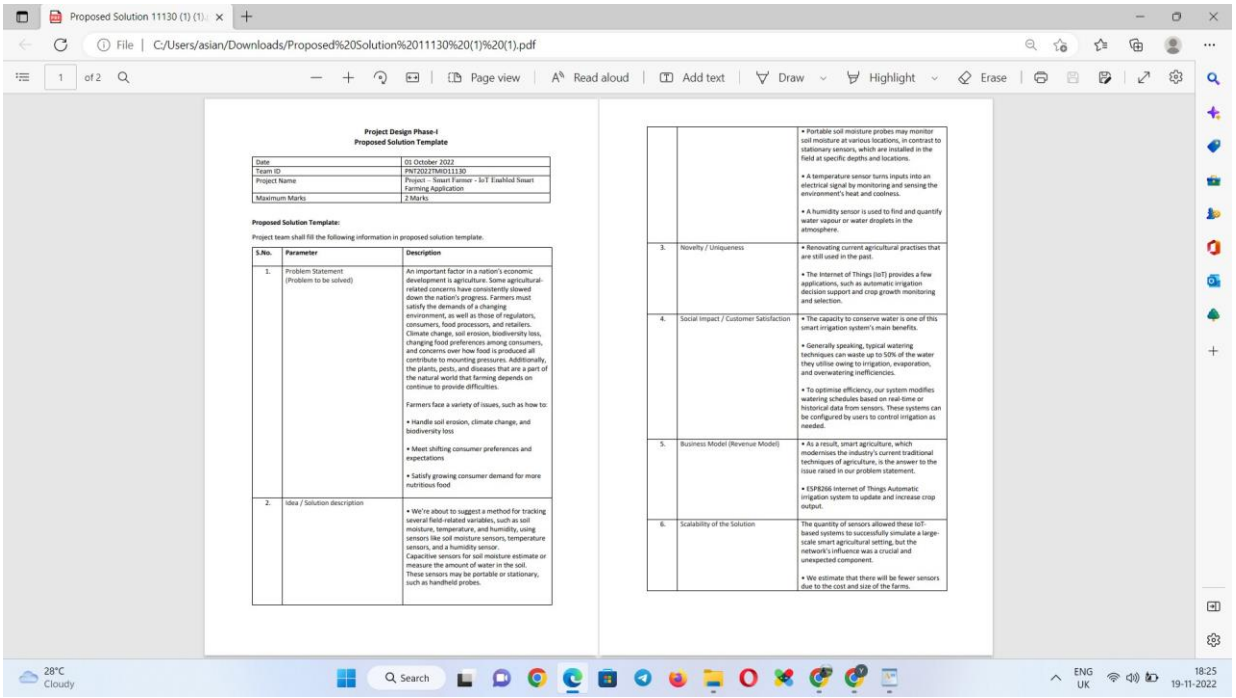


PROBLEM SOLUTION FIT:

SmartFarmer - IoT Enabled Smart Farming Application



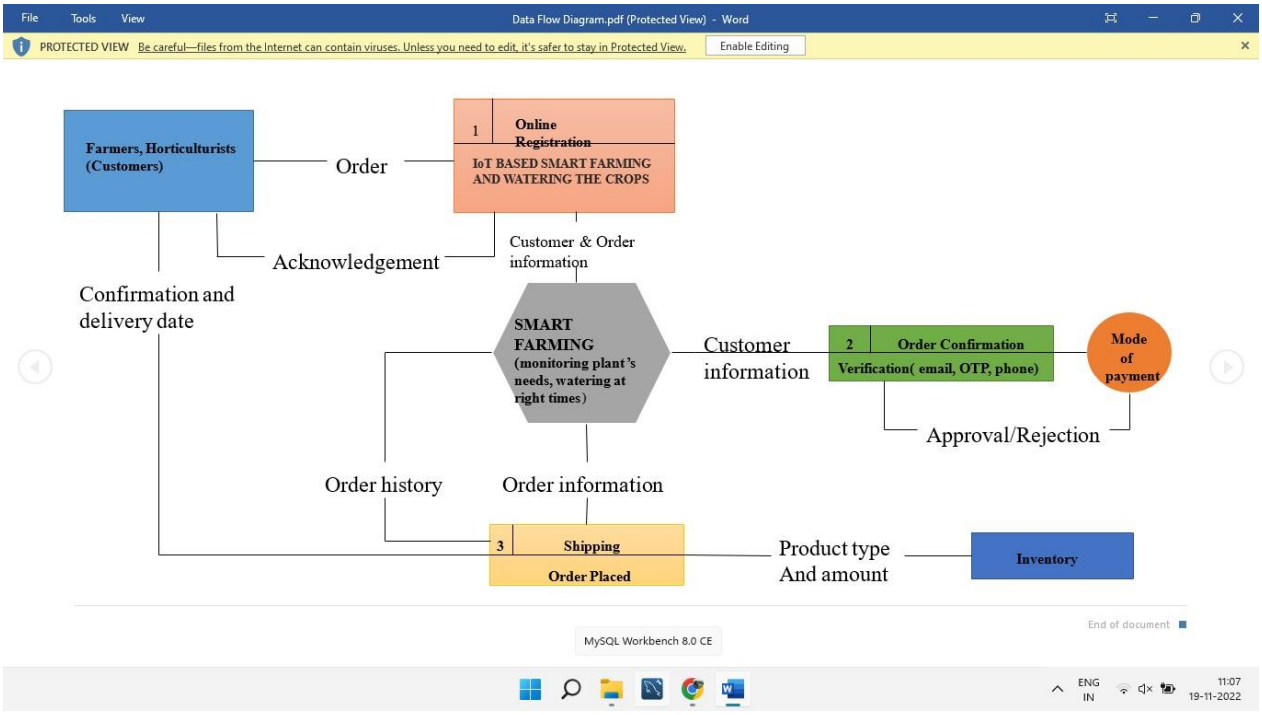
PROPOSED SOLUTION TEMPLATE :



Date	01 October 2022
Team ID	PNT2022TMID11130
Project Name	Project – Smart Farmer - IoT Enabled Smart Farming Application
Maximum Marks	2 Marks

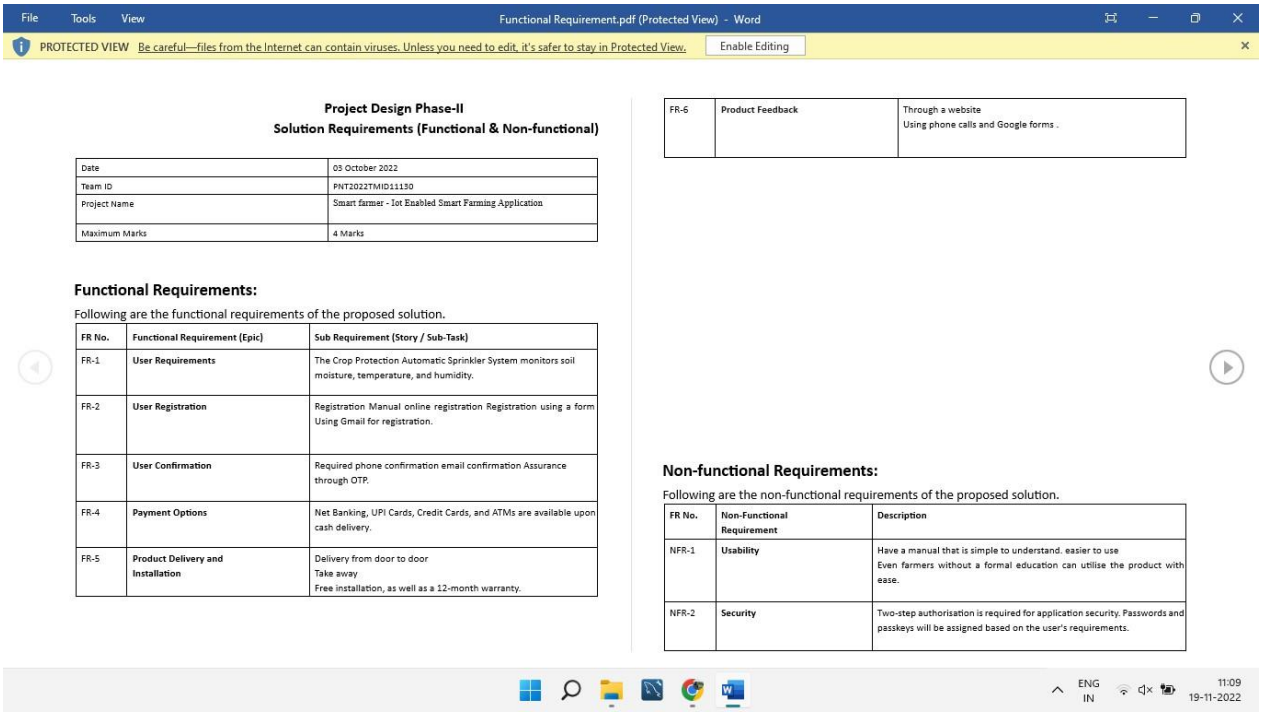
S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	An important factor in a nation's economic development is agriculture. Some agricultural-related concerns have consistently slowed down the nation's progress. Farmers must satisfy the demands of a changing environment, as well as those of regulators, consumers, food processors, and retailers. Climate change, soil erosion, biodiversity loss, changing food preferences among consumers, and concerns over how food is produced all contribute to mounting pressures. Additionally, the plants, pests, and diseases that are a part of the natural world that farming depends on continue to provide difficulties. Farmers face a variety of issues, such as how to: • Handle soil erosion, climate change, and biodiversity loss • Meet shifting consumer preferences and expectations • Satisfy growing consumer demand for more nutritious food
2.	Idea / Solution description	• We're about to suggest a method for tracking several field-related variables, such as soil moisture, temperature, and humidity, using sensors like soil moisture sensors, temperature sensors, and a humidity sensor. Capacitive sensors for soil moisture estimate or measure the amount of water in the soil. These sensors may be portable or stationary, such as handheld probes.
		• Portable soil moisture probes may monitor soil moisture at various locations, in contrast to stationary sensors, which are installed in the field at specific depths and locations. • A temperature sensor turns inputs into an electrical signal by monitoring and sensing the environment's heat and coolness. • A humidity sensor is used to find and quantify water vapour or water droplets in the atmosphere.
3.	Novelty / Uniqueness	• Renovating current agricultural practises that are still used in the past. • The Internet of Things (IoT) provides a few applications, such as automatic irrigation decision support and crop growth monitoring and selection.
4.	Social Impact / Customer Satisfaction	• The capacity to conserve water is one of this smart irrigation system's main benefits. • Generally speaking, typical watering techniques can waste up to 50% of the water they utilise owing to irrigation, evaporation, and overwatering inefficiencies. • To optimise efficiency, our system modifies watering schedules based on real-time or historical data from sensors. These systems can be configured by users to control irrigation as needed.
5.	Business Model (Revenue Model)	• As a result, smart agriculture, which modernises the industry's current traditional techniques of agriculture, is the answer to the issue raised in our problem statement. • ESP8266 Internet of Things Automatic irrigation system to update and increase crop output.
6.	Scalability of the Solution	The quantity of sensors allowed these IoT-based systems to successfully simulate a large-scale smart agricultural setting, but the network's influence was a crucial and unexpected component. • We estimate that there will be fewer sensors due to the cost and size of the farms.

PROJECT DESIGN PHASE – II
DATA FLOW DIAGRAM :



FUNCTIONAL & NON-FUNCTIONAL REQUIREMENTS :

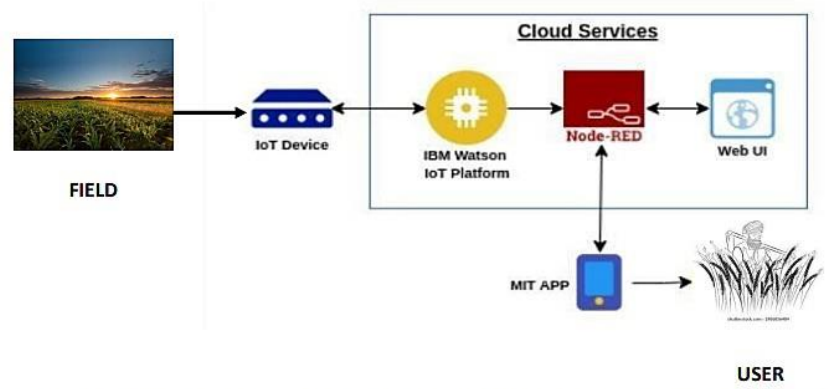
Project Design Phase-II



TECHNOLOGY ARCHITECTURE :

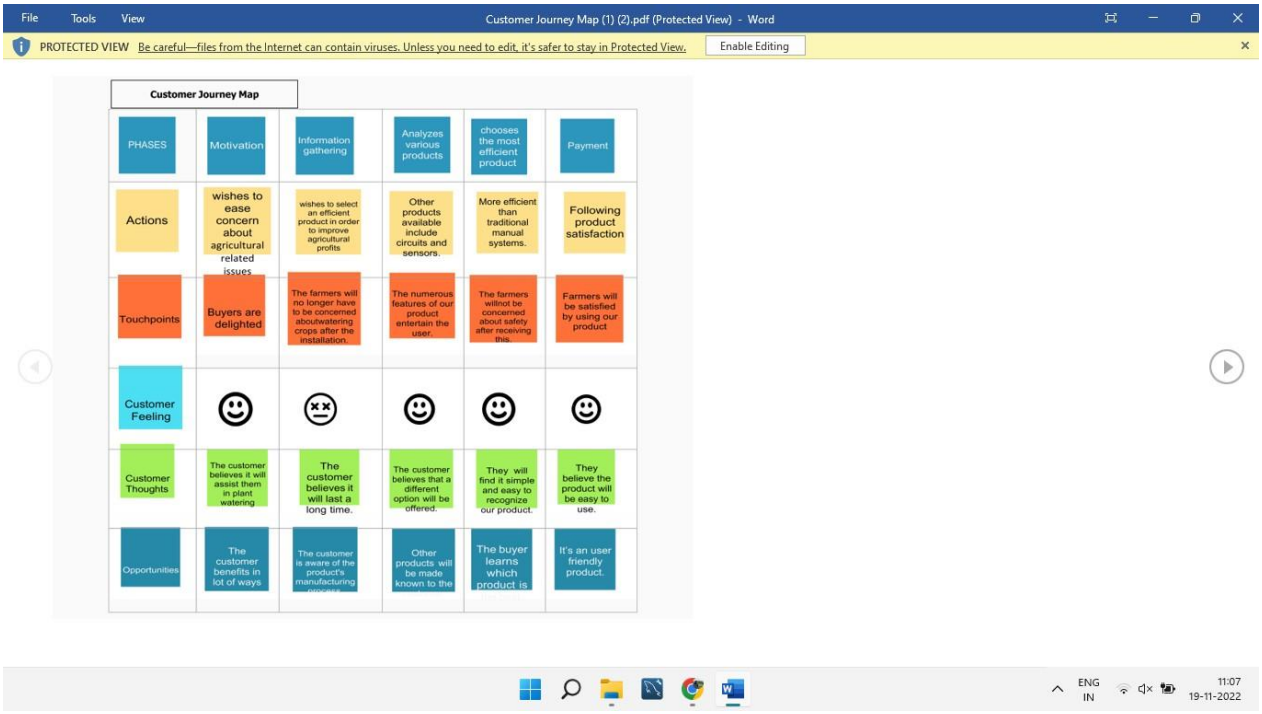
Solution Architecture Diagram:

Solution Architecture Diagram:



Architecture and data flow of the IoT Based Enabled Smart Farming Application

CUSTOMER JOURNEY MAP



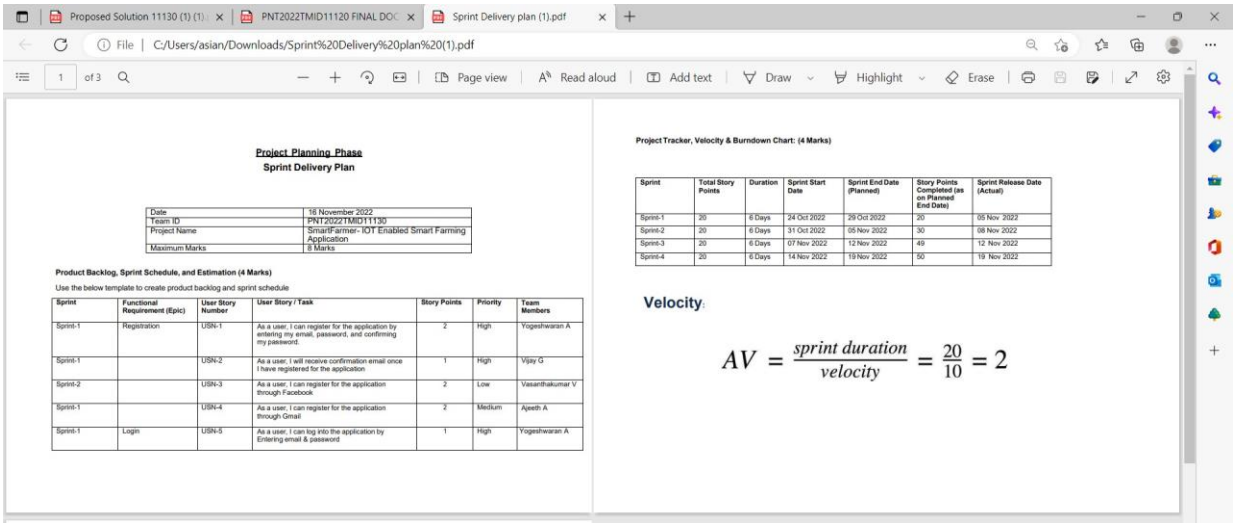
PROJECT PLANNING PHASE
MILESTONE & ACTIVITY
LIST :PROJECT PLANNING
PHASE

Project Name	SmartFarmer-IOT Enabled Smart Farming Application
Maximum Marks	4 marks

S.NO	ACTIVITY TITLE	ACTIVITY DESCRIPTION	DURATION
1	Understanding the project requirement	Assign the team members and create repository in the Github, Assign the task to each members and teach how to use and open and class the Github and IBM career education	1 WEEK
2	Starting of project	Advice students to attend classes of IBM portal create and develop an rough diagram based on project description and gather of information on IOT and IBM project and team leader assign task to each member of the project	1 WEEK
3	Attend class	Team members and team lead must watch and learn from classes provided by IBM and NALAYATHIRAN and must gain access of MIT license for their project	4 WEEK

SPRINT DELIVERY

Project Planning PhaseSprint
Delivery Plan



Project Planning Phase

Sprint Delivery Plan

Date	18 November 2022
Team ID	PNT2022TMID11130
Project Name	SmartFarmer- IOT Enabled Smart Farming Application
Maximum Marks	8 Marks

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

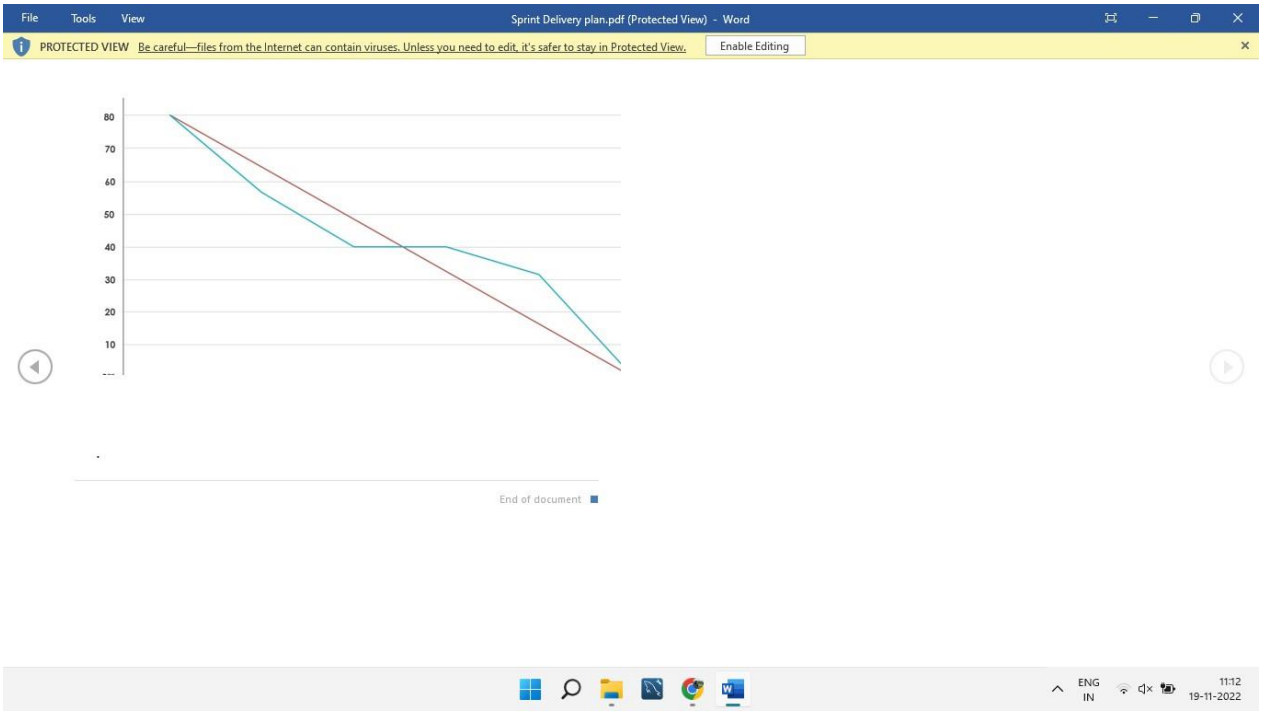
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	Yogeshwaran A
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	Vijay G
Sprint-2		USN-3	As a user, I can register for the application through Facebook	2	Low	Vasanthakumar V
Sprint-1		USN-4	As a user, I can register for the application through Gmail	2	Medium	Ajeeth A
Sprint-1	Login	USN-5	As a user, I can log into the application by Entering email & password	1	High	Yogeshwaran A

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	05 Nov 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	30	08 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	49	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	50	19 Nov 2022

Velocity:

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$



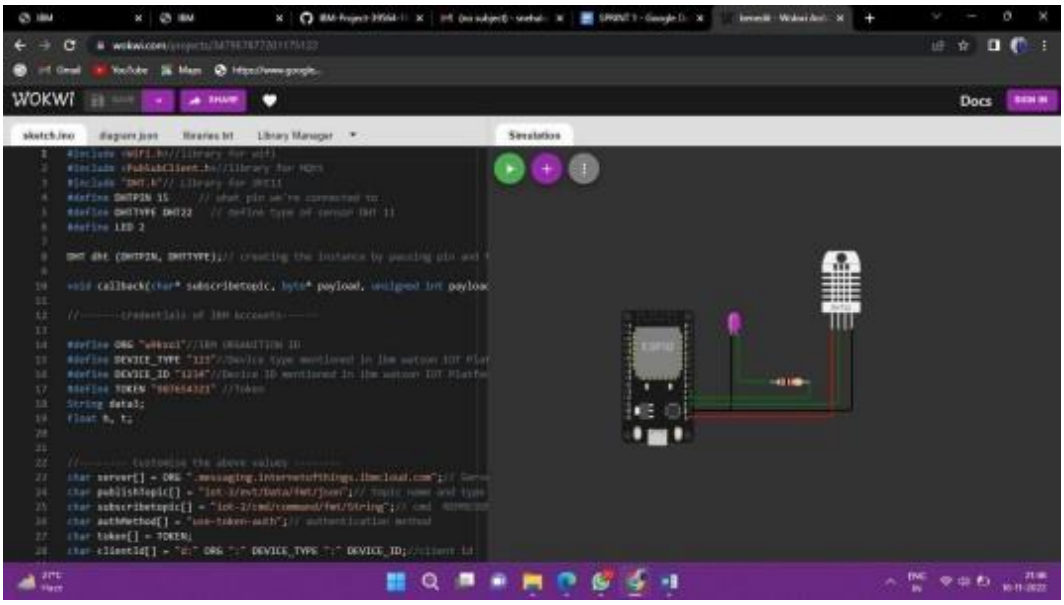
PROJECT DEVELOPMENT PHASE :

SPRINT 1 :

SMART FARMER – IOT ENABLED SMART FARMING APPLICATION

PROJECT DEVELOPMENT – DELIVERY OF SPRINT - 1

Connect Sensor in ESP8266
CIRCUIT DIAGRAM



Develop a Python Code:

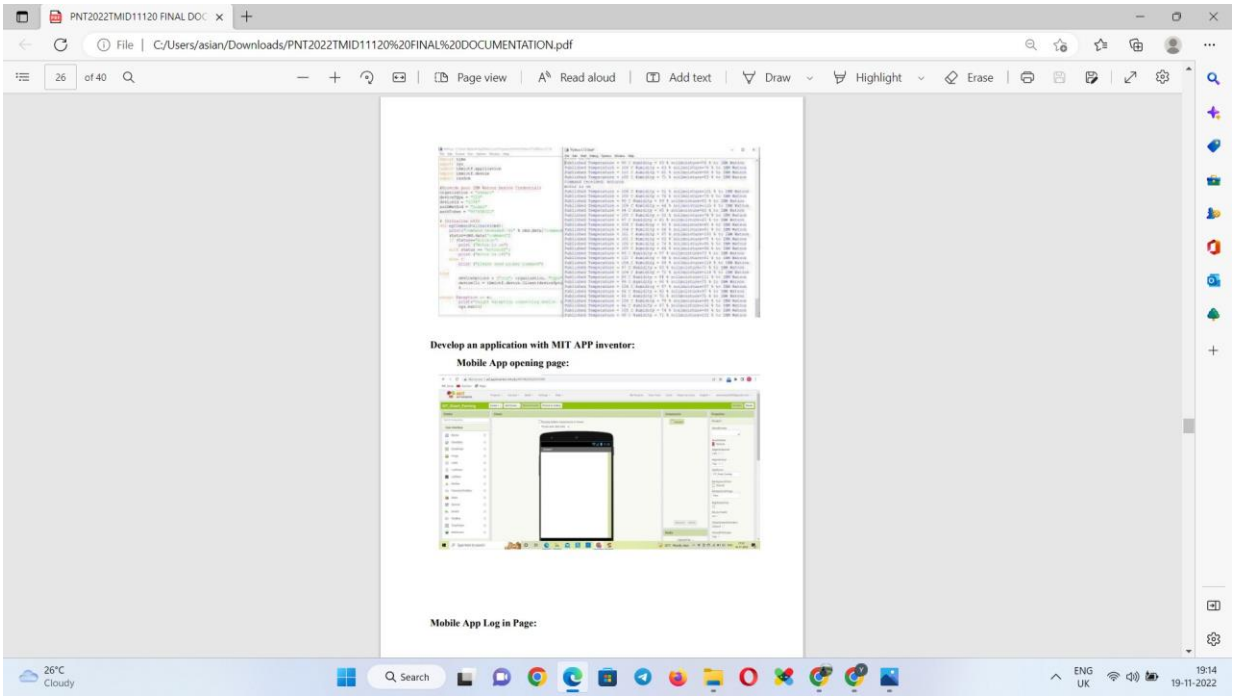
Code:

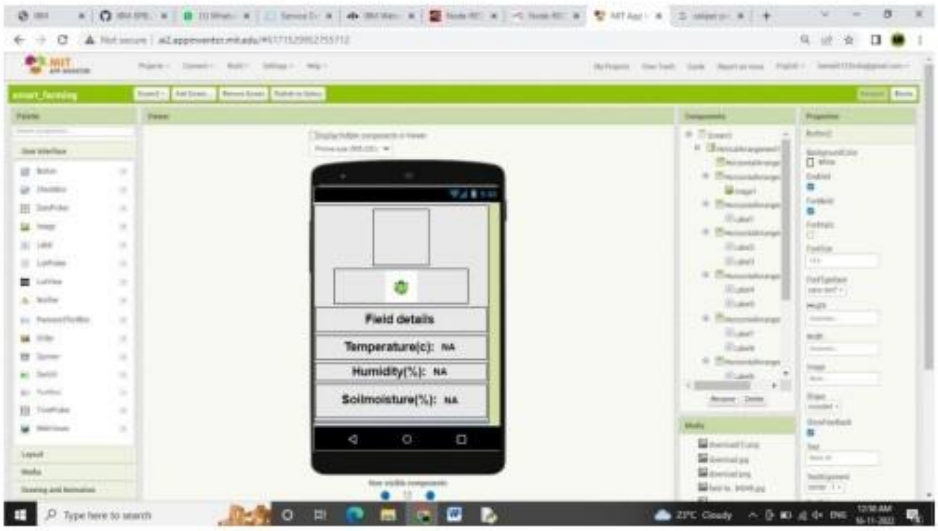
```
import time import
sys import
ibmiotf.application
import ibmiotf.device
import random

#Provide your IBM Watson Device Credentials
organization = "w9kzof" deviceType = "123"
deviceId = "1234" authMethod = "token"
authToken =
"9876543211"

# Initializa GPIO def myCommandCallback(cmd):
print("Command received: %s" % cmd.data['command'])
status=cmd.data['command']  if status=="motoron":
print ("motor is on")  elif status == "motoroff":  print
("motor is off")  else :
 print ("please send proper command") 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:
 #Get Sensor Data from DHT11

 temp=random.randint(90,110)
 Humid=random.randint(60,100)
```

```
moist=random.randint(50,120)   data = { 'temp' :
temp, 'Humid': Humid ,'moist':moist}
 #print data  def myOnPublishCallback():  print
("Published Temperature = %s C" % temp,
"Humidity = %s %%"
% Humid,"soilmoisture=%s %%" %moist, "to IBM
Watson")

 success = deviceCli.publishEvent("IoTSensor",
"json", data,
qos=0,  on_publish=myOnPublishCallback
)
 if not success:  print("Not connected
to IoTF")
time.sleep(10)

 deviceCli.commandCallback = myCommandCallback

# Disconnect the device and application from the cloud
deviceCli.disconnect()
```

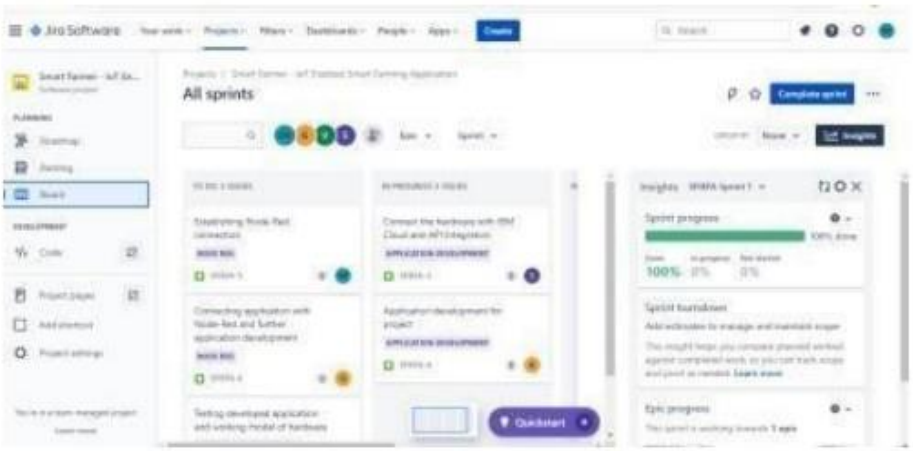
OUTPUT:

SmartFarmer - IoT Enabled Smart Farming Application




Field details
Temperature(c): NA
Humidity(%): NA
Soilmoisture(%): NA

JIRA Software Sprint Planning:



SPRINT 2 : SMART FARMER – IOT ENABLED SMART FARMING APPLICATION PROJECT DEVELOPMENT – DELIVERY OF SPRINT – 2

Connecting Sensors with Arduino using C++ code :-

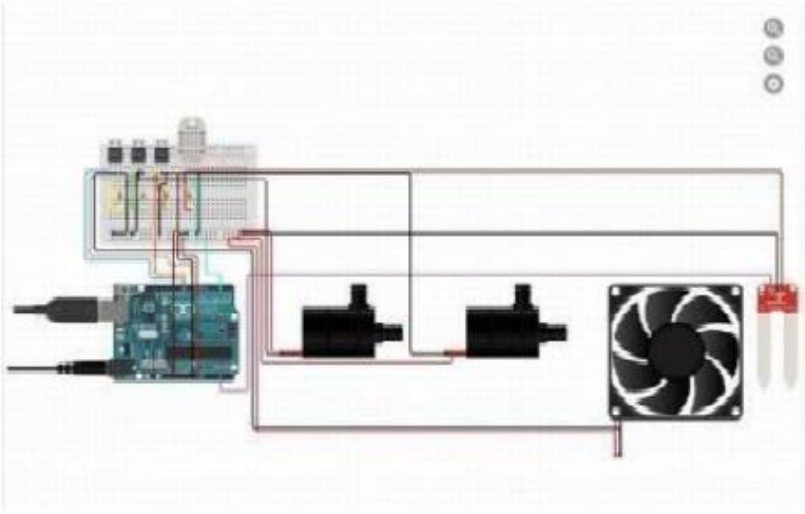
```
include "Arduino.h"
#include "DHT.h"
// #include "Fan.h"
#include "SoilMoisture.h" //
#include "Pump.h"


#define DHTPIN 2
#define DHTTYPE DHT22 // DHT 22 (AM2302), AM2321
#define soil A3
#define pump 6
#define sprinkler 9
#define dryer 5

DHT dht(DHTPIN, DHTTYPE);

void setup() {
Serial.begin(115200);

 dht.begin();
```

```
}
void loop() {   float temperature =
dht.readTemperature();   float humidity =
dht.readHumidity();

 if (isnan(temperature) || isnan(humidity)) {
Serial.println(F("Failed to read from DHT sensor!"));   return;
 }
 Serial.print(F("Humidity: "));
Serial.print(humidity);
Serial.print(F("% Temperature: "));
Serial.print(temperature);
Serial.println(F("°C "));

 if(humidity < 75 && temperature >30)
 {
```

```
{
digitalWrite(sprinkler, LOW);
digitalWrite(dryer, LOW);
}

int sensor_analog = analogRead(soil);   float mp
= (100-((sensor_analog/1023.00)*100));

if(mp<40)
digitalWrite(pump, HIGH);
else
digitalWrite(pomp, LOW);

delay(1000);
```

```
}
```

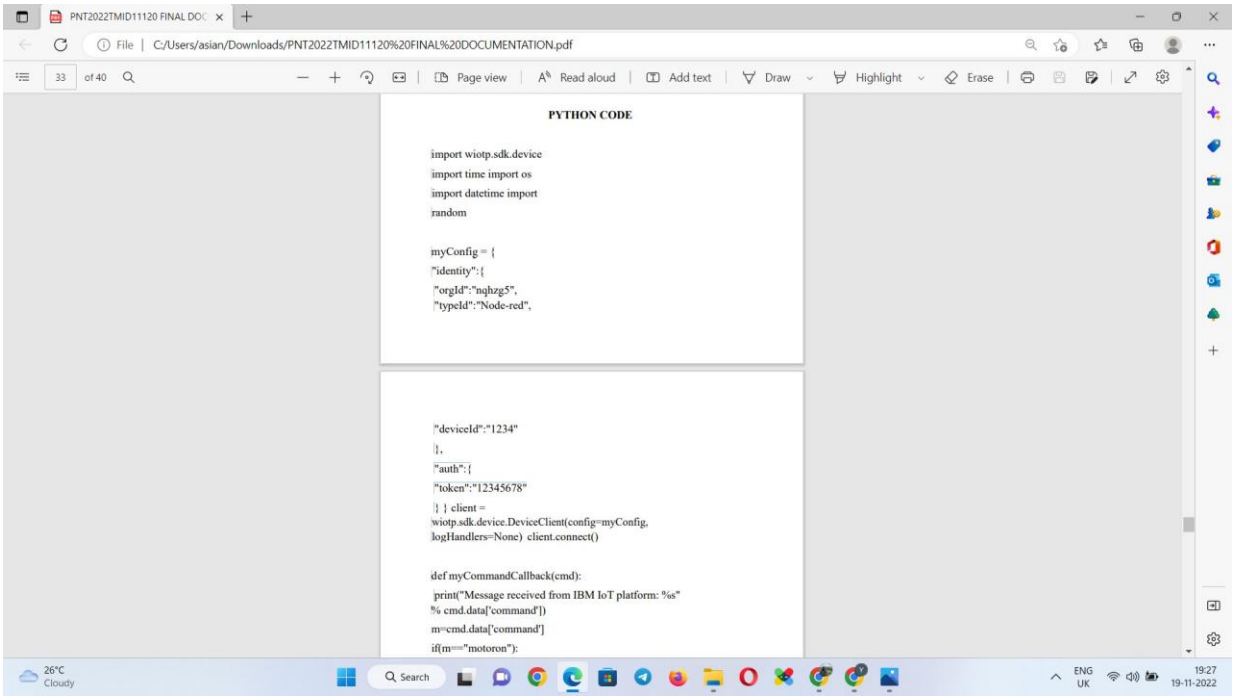
Circuit Diagram



SPRINT 3 : SMART FARMER – IOT ENABLED SMART FARMING APPLICATION PROJECT DEVELOPMENT – DELIVERY OF SPRINT – 3

DEVELOP A PYTHON SCRIPT TO PUBLISH AND SUBSCRIBE TO IBM IOT PLATFORM:

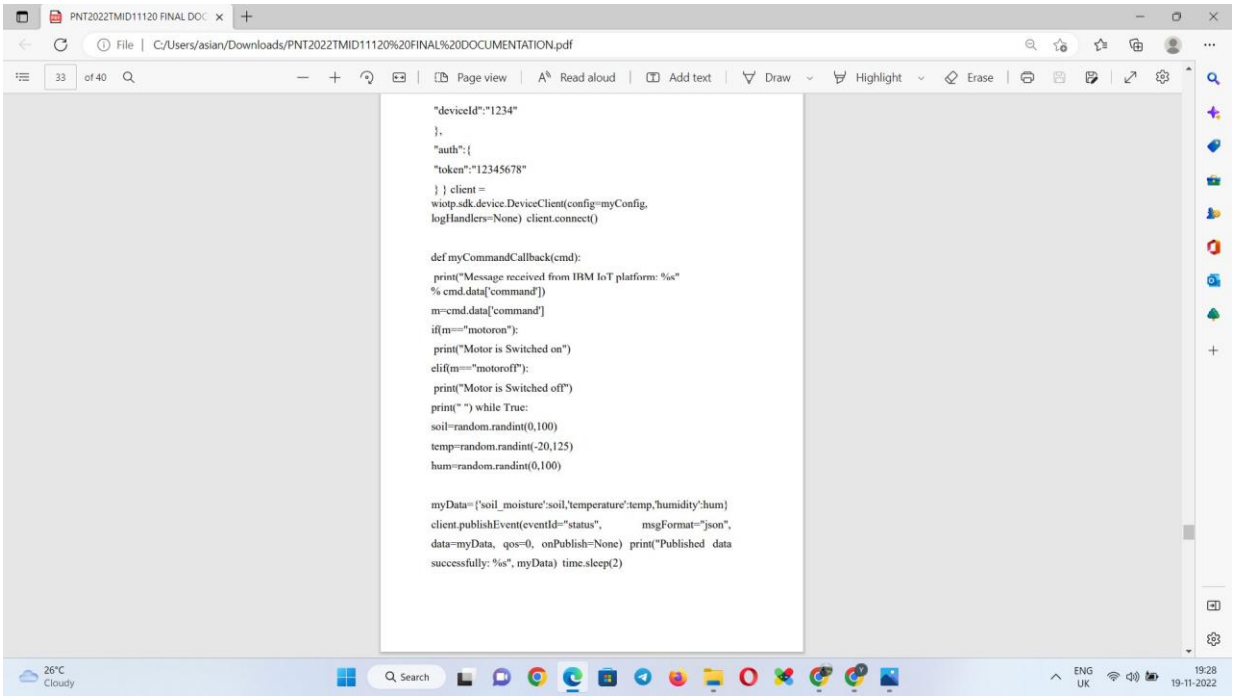
PYTHON CODE



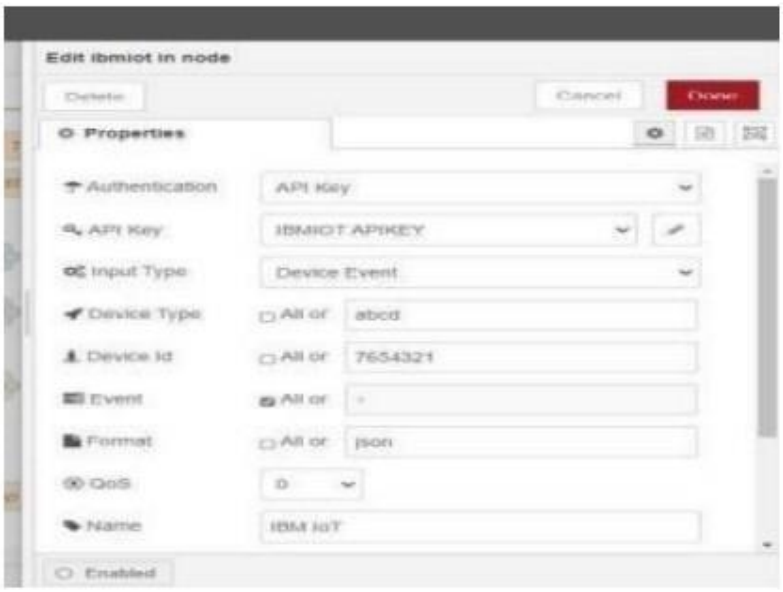
PYTHON CODE

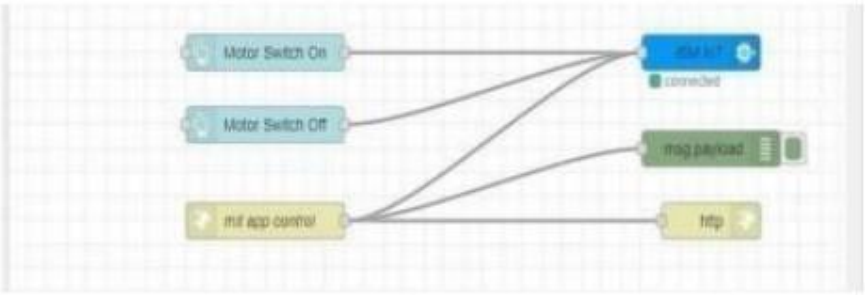
```
import wiotp.sdk.device
import time import os
import datetime import
random

myConfig = {
"identity":{
"orgId":"nqhzg5",
"typeId":"Node-red",
"deviceId":"1234"
},
"auth":{
"token":"12345678"
} } client =
wiotp.sdk.device.DeviceClient(config=myConfig,
logHandlers=None) client.connect()

def myCommandCallback(cmd):
print("Message received from IBM IoT platform: %s"
% cmd.data['command'])
m=cmd.data['command']
if(m=="motoron"):
```

SmartFarmer - IoT Enabled Smart Farming Application

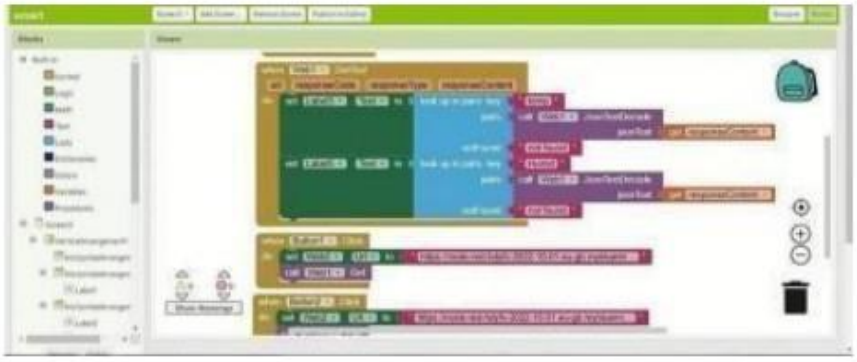


OUTPUT





MOBILE APP WEB:



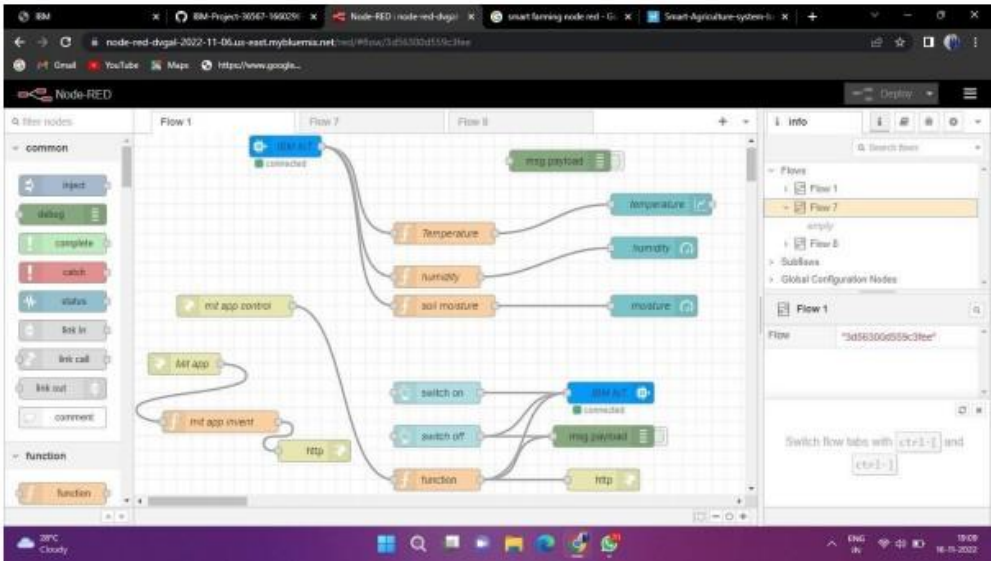
SPRINT 4: SMART FARMER – IOT ENABLED SMART FARMING APPLICATION PROJECT DEVELOPMENT – DELIVERY OF SPRINT – 4

BUILD A WEB APPLICATION USING

NODERED SERVICES:

STEP 1:

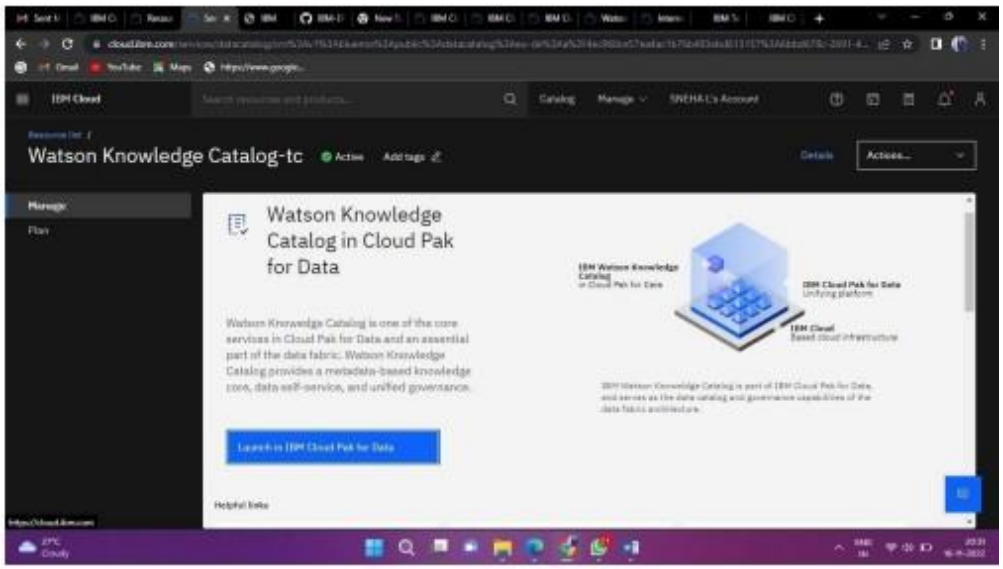
NODE-RED



OUTPUT :

STEP 2:

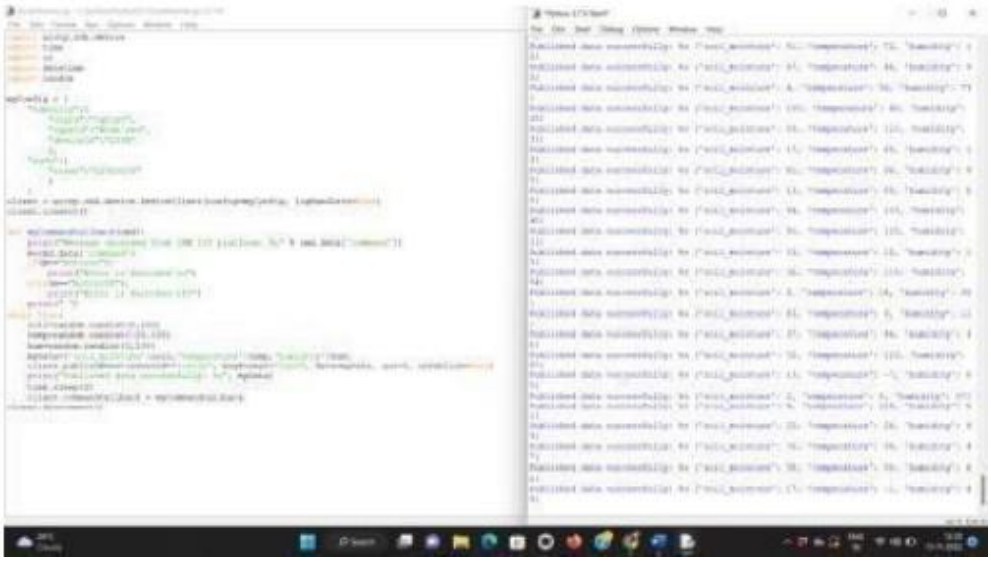
IBM WATSON DEVICE PLATFORM



OUTPUT SCREENSHOT:

STEP 3:

PYTHON SCRIPT

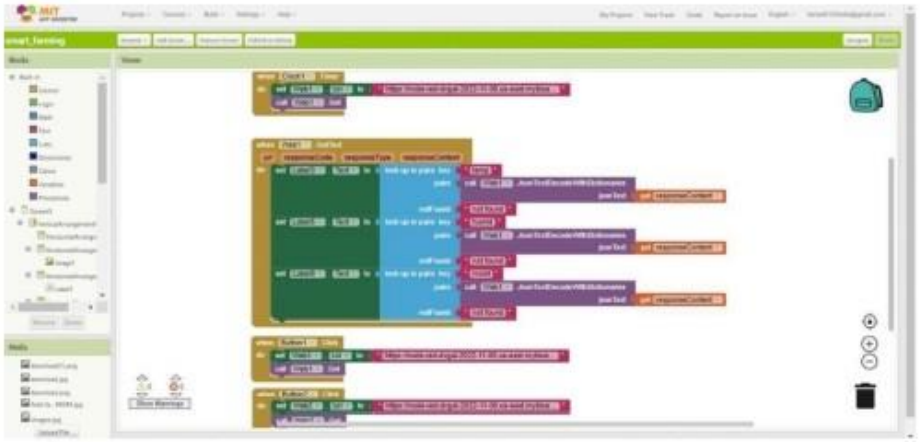


DEVELOP A MOBILE APPLICATION:

STEP 1:

MIT APP INVENTOR

BLOCKS:



MOBILE SCREEN:


Screen1
SmartFarming
Temperature (C) : 100
Humidity (%) : 7
Soil_moisture(value) : 57
MOTOR ON
MOTOR OFF