# PROJECT REPORT

## IoT BASED SMART CROP PROTECTION SYSTEM FOR AGRICULTURE

## TEAM ID : PNT2022TMID04647


| S.No | CONTENT | PAGE.No |
|---|---|---|
| **1.** | **INTRODUCTION** | |
| | 1.1 Project Overview | 3 |
| | 1.2 Purpose | 3 |
| **2.** | **LITERATURE SURVEY** | |
| | 2.1 Existing Problem | 4 |
| | 2.2 References | 5 |
| | 2.3 Problem Statement | 6 |
| **3.** | **IDEATION & PROPOSED SOLUTION** | |
| | 3.1 Empathy Map Canvas | 7 |
| | 3.2 Ideation & Brainstorming | 7 |
| | 3.3 Proposed Solution | 12 |
| | 3.4 Problem Solution Fit | 14 |
| **4.** | **REQUIREMENT ANALYSIS** | |
| | 4.1 Functional requirement | 15 |
| | 4.2 Non-Functional Requirements | 15 |
| **5.** | **PROJECT DESIGN** | |
| | 5.1 Data Flow | 17 |

| | | |
|---|---|---|
| | 5.2 Solution & Technical Architecture | 18 |
| | 5.3 User Stories | 19 |
| **6.** | **PROJECT PLANNING & SCHEDULING** | **20** |
| | 6.1 Sprint Planning & Estimation | 22 |
| | 6.2 Sprint Delivery Schedule | 22 |
| | 6.3 Report from JIRA | 23 |
| **7.** | **CODING & SOLUTIONING** | **24** |
| | 7.1 Feature 1 | 24 |
| | 7.2 Feature 2 | 28 |
| **8.** | **TESTING** | |
| | 8.1 Test Cases | 29 |
| | 8.2 User Acceptance Testing | 30 |
| **9.** | **RESULTS** | |
| | 9.1 Performance Metrics | 32 |
| **10.** | **ADVANTAGES & DISADVANTAGES** | **32** |
| **11.** | **CONCLUSION** | **32** |
| **12.** | **FUTURE SCOPE** | **33** |
| **13.** | **APPENDIX** | **33** |
| | 13.1 Github | 33 |

# 1.INTRODUCTION

## 1.1 Project Overview

The title of our project is “IOT BASED SMART CROP PROTECTION FOR AGRICULTURE” .The overview of our Projectis to Safeguard the farm from climatic changes like soil erosion, landslide and birds, animals etc… So, that we are making a cloud based project and placing IOT based sensor. Over which it will produce sounds and notification and provide results on IOT MIT app. From which we can protect our farm. And it will provide better yieldfor us.

## 1.2 Purpose

The main purpose of our project is to protect the farm from climatic changes, Animals, Birds, Pests and to make the crop togrow better and provide better yield.

# 2.LITERATURE SURVEY

## 2.1 Existing Problem

- “Food” is the important thing, which is needed for everyone to survive in this world. For that farmers are doing their own part in a effectivemanner, during which they have to face some problems such as:
- There are increasing pressures from climate change, soil erosion andbiodiversity loss and from consumers’ changing tastes in food and concerns about how it is produced.
- And the natural world that farming works with – plants, pests anddiseases continue to pose their own challenges beyond that, they have to stay resilient against global economic factors.
- Inspire young people to stay in rural areas and become future farmers.
- The effects of climate change affect farmers’ ability to grow the food we all need. Increasingly volatile weather and more extreme events –like floods and droughts change growing seasons, limit the availability ofwater, allow weeds, pests and fungi to thrive, and can reduce crop productivity.

| SLNO | TITLE | YEAR | TECHNIQUE USED | ADVANTAGE | DRAWBACK |
|---|---|---|---|---|---|
| 1. | A model for smart Agriculture Using IOT | 2016 | ZigBee with wings | A complete real -time and historical environment information ,eff icient management and utilization of resources | The technique can achieve convenient wireless connection only within a short-distance |
| 2. | Automatic control of Agriculture pumps based on soil Moisture sensing | 2015 | For testing N1 MULTISM simulation software is used.DIAC and TRIAC technique. | Achieves proper water management ,s aves human power and enhances crop or productivity | Does not support several water levels and uses old techniques. |
| 3. | Automated Irrigation System Using a Wireless Sensor Network and GPRS module | 2014 | WSUs and a WIU , based on microcontroller ZigBee and GPRS technologies. | Feasible and cost effective for optimizing water resources for agricultural production | The investment in electric power supply is expensive. |
| 4. | An effective method for Crop Monitoring Using Wireless sensor Network | 2014 | WSN with GSM technology | A Can collect data from locations previously inaccessible on a Micro-measurement scale. | Provides only precision values that is not accurate and is not effective. |

## 2.2 References

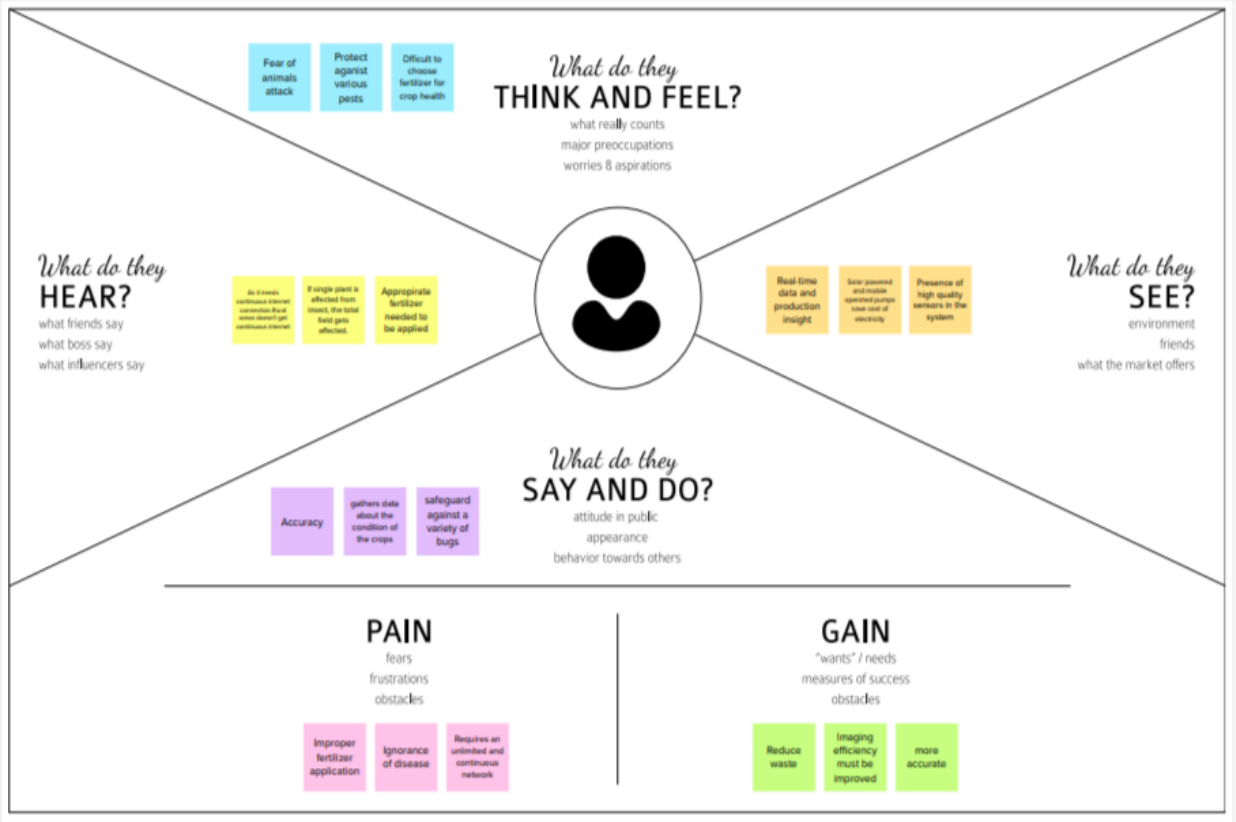

1. https://smartinternz.com/assests/docs/Smart%20Home%20Automation%20using%20IBM%20cloud%20Service s%20(1).pdf
2. https://smartinternz.com/assets/docs/Smart%20Home%20Automation%20using%20IBM%20cloud%20Service s%20(1).pdf
3. https://openweathermap.org/
4. https://www.youtube.com/watch?v=cicTw4SEdxk
5. https://github.com/rachuriharish23/ibmsubscribe

## 2.3 Problem Statement

1. Agriculture is one of the area which required urgent attention andadvancement for high yield and efficient utilisation of resources.
2. In this paper an approach smart crop monitoring is presented throughInternet of Things (IOT).
3. A Level 4 framework is proposed namely sensing devices, sensor data level, base station level, edge computing and cloud data level for smartcrop monitoring.
4. In this Project, Farm is going to get protected from humidity,Temperature and Animals with the help of IOT cloud module.
5. The Agricultural Farm is been monitored with the help of MIT appand then data will be collected and stored in it cloud.
6. It will monitor and sense the humidity level and movement ofanimals and will sent the message as notification to the user.

# 3.IDEATION & PROPOSED SOLUTION

## 3.1 Empathy Map Canvas




## 3.2 Ideation and Brainstorming

**What do they think and feel?**

As its name may imply, smart farming is the use of technology in animal agriculture, and its something that's been around since the Industrial Revolution. The biggest difference between then and now, though? "Motorized devices are being replaced with IOT".

**What do they hear?**

Smart farming is about using the new technologies whichhave arisen at the drawn of the Fourth Industrial Revolution in the area of Agriculture and cattle production to increase quality and quantity by making maximum use of resources and minimizing the environmental impact.

**What do they see?**

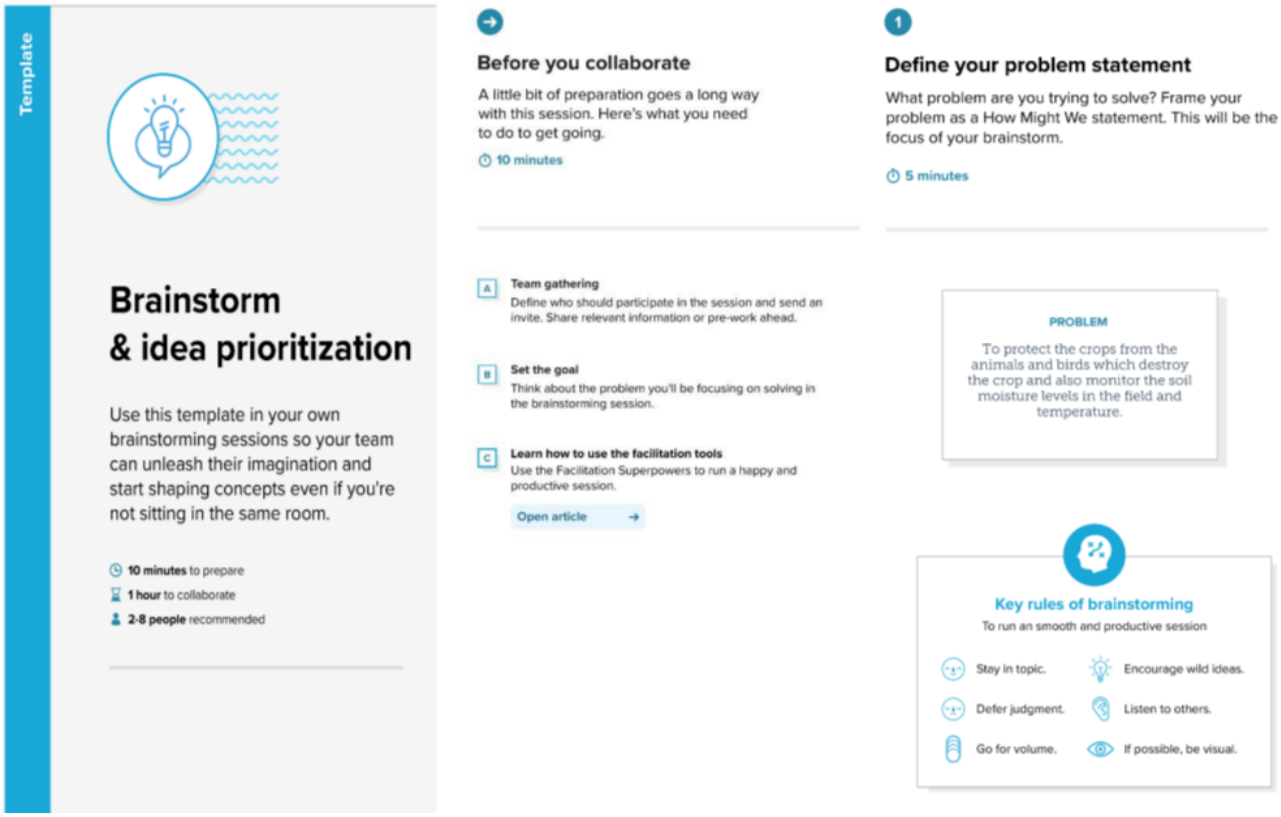
Smart farming is a management concept focused on providing the agriculture industry with the infrastructure to leverage advanced technology - including Big Data, the cloud and the Internet of Things(IOT)- for tracking, monitoring , Automating and Analysing operations.

**What do they say and do?**

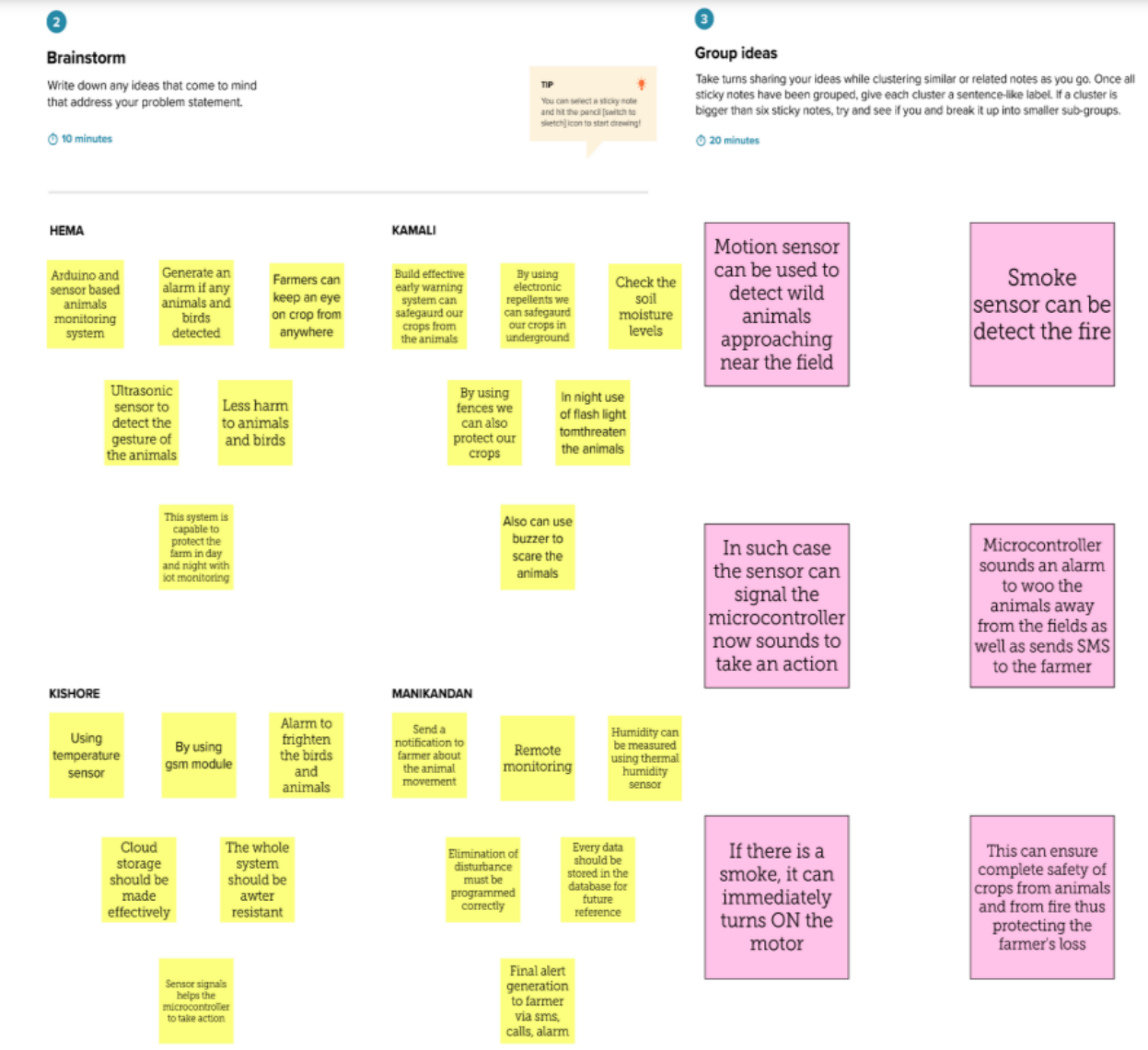
The aim of this technology is to make The most of all the Data collected by various tools, by converting them into real sources if information in order to the define ways of simplifying agricultural work.It also allow for accurate and Predictive analysis of all situation that may affect the farms, Such as weather condition (temperature, humidity etc..) and sanitary .For Example: This makes it easier to organize the supply of energy ,water, livestock feed and fertilizer.

**BRAINSTORM**

Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



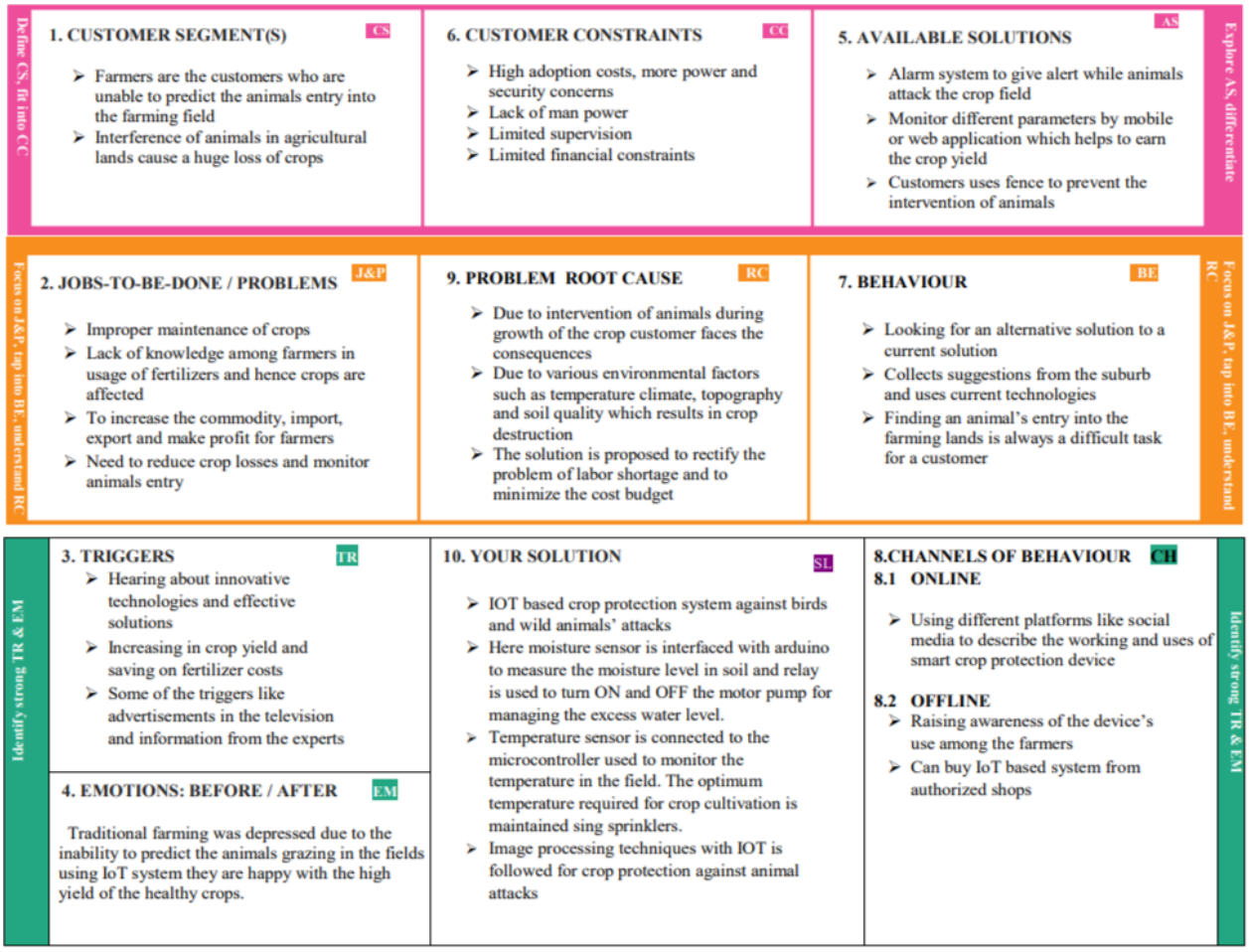
Step-3: Idea Prioritization

## 3.3 Proposed Solution

| S.No. | Parameter | Description |
|---|---|---|
| 1. | Problem Statement (Problem to be solved) | ➢ Develop smart and affordable system to protect crops from wild animals that works well to keep an eye on and alert users (Farmers).<br>➢ To prevent the farmer from visiting the farm at night, this system will also incorporate remote monitoring and control of pump. |
| 2. | Idea / Solution description | ➢ Here we proposed automatic crop protection system from wild animals.<br>➢ This is the microcontroller-based system using PIC family controller, which use a monitor sensor to detect wild animals approaching near the field.<br>➢ The microcontroller now emits an alarm to entice the animals out of the field and sends a text message to the farmer alerting him to the problem, so he may respond by arriving at the spot if the animals don't leave after hearing the alarm.<br>➢ This ensures complete safety of crops from animals thus protecting the farmers loss. |
| 3. | Novelty / Uniqueness | ➢ Additionally, the gadget will track the soil moisture levels, temperature, and humidity readings and transmit them to the IBM IoT Platform.<br>➢ Through IoT and smart farming, the dependence of manual labor has reduced significantly.<br>➢ Fastest alerts to farmers<br>➢ User friendly |

| | | |
|---|---|---|
| 4. | Social Impact / Customer Satisfaction | ➢ Periodically checking the crop was a staple of old farming techniques, which required the farmers to be out in the field.<br>➢ The data obtained by the smart sensors will enable us to monitor things like crop's growth, soil quality, weather conditions and more.<br>➢ Enhance productivity while saving farmer's lives and can work with irrespective of fear. |
| 5. | Business Model (Revenue Model) | ➢ Community-based resolution provided by FAQs Contract farming solutions.<br>➢ IoT-based solutions assist farmers in making the changeover to more affordable and environment friendly farming practises. |
| 6. | Scalability of the Solution | ➢ Wild animals have the potential to significantly reduce crop yields and generate further financial issues.<br>➢ Consider the fact that crop security from wild animals necessitates taking extra precautions.<br>➢ Farmers can make better on-farm decisions such as the optimal time to plant, irrigate, protect or harvest their crops.<br>➢ It creates immense economies of scale, lowers expenses, helps save scarce resources and boosts production. |

## 3.4 Problem Solution Fit



# 4.REQUIREMENT ANALYSIS

## 4.1 Functional Requirement

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|---|---|---|
| FR-1 | User Registration | ➢ Install the app<br>➢ Sign up with Gmail or Mobile number<br>➢ Creating a profile<br>➢ Understanding the guidelines. |
| FR-2 | User Confirmation | ➢ Confirmation via Email<br>➢ Confirmation via OTP |
| FR-3 | Accessing Datasets | Data's are acquired using Cloudant DB. |
| FR-4 | Interface Sensor | Connect the sensor and the application so that an alarm is issued when animals enter the field. |
| FR-5 | Mobile Application | It is used to control motors and sense animals near the crop field, sounds alarm to woo them away as well as sends SMS to farmers using cloud service. |
| FR-6 | Authorization and Business rules | ➢ Healthcare provider group<br>➢ Decision making<br>➢ Marketing |

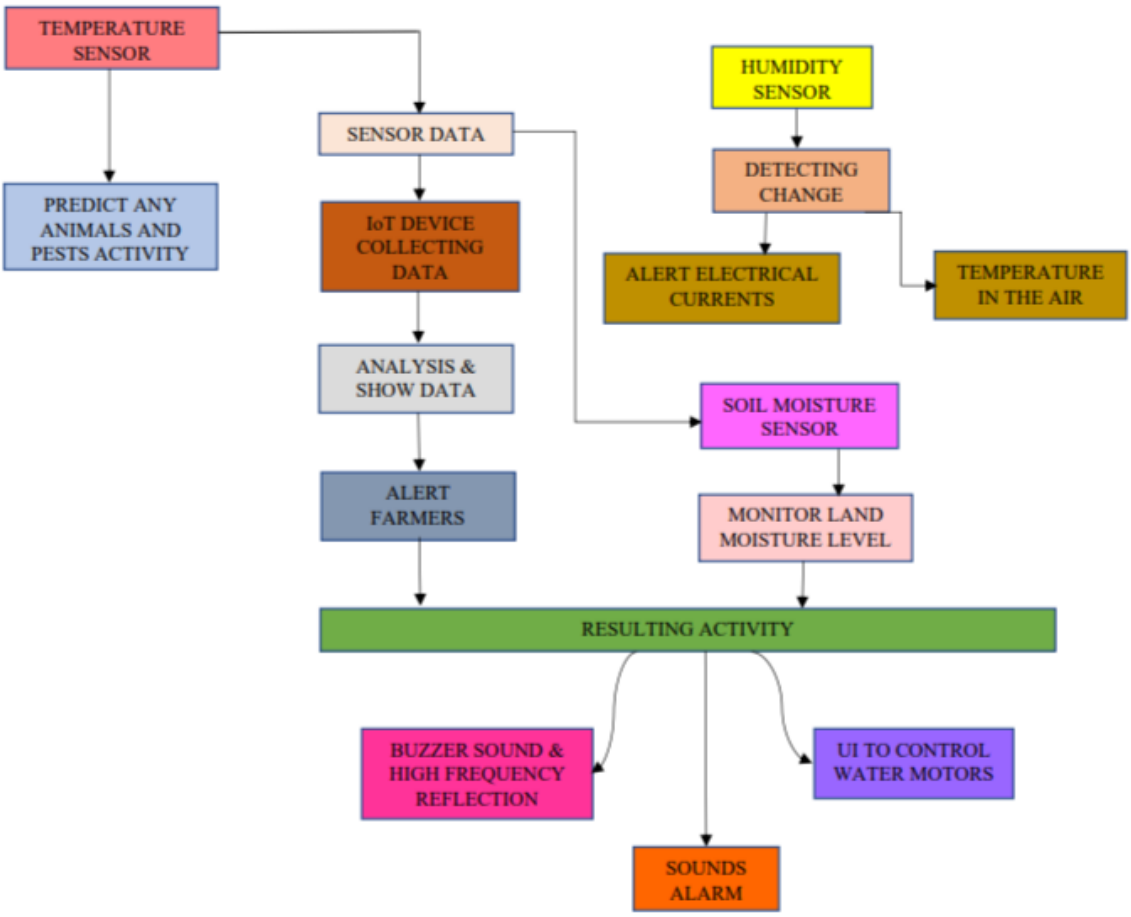
## 4.2 Non-Functional Requirements

| FR No. | Non-Functional Requirement | Description |
|---|---|---|
| NFR-1 | **Usability** | ➢ Through the implementation of a smart crop protection system, this project contributes to agricultural protection.<br>➢ Indicates how effectively and easily the users can use and learn about the smart systems.<br>➢ Crop yield predictor will help the farmers to make decisions in future recommendations of best crop and help |

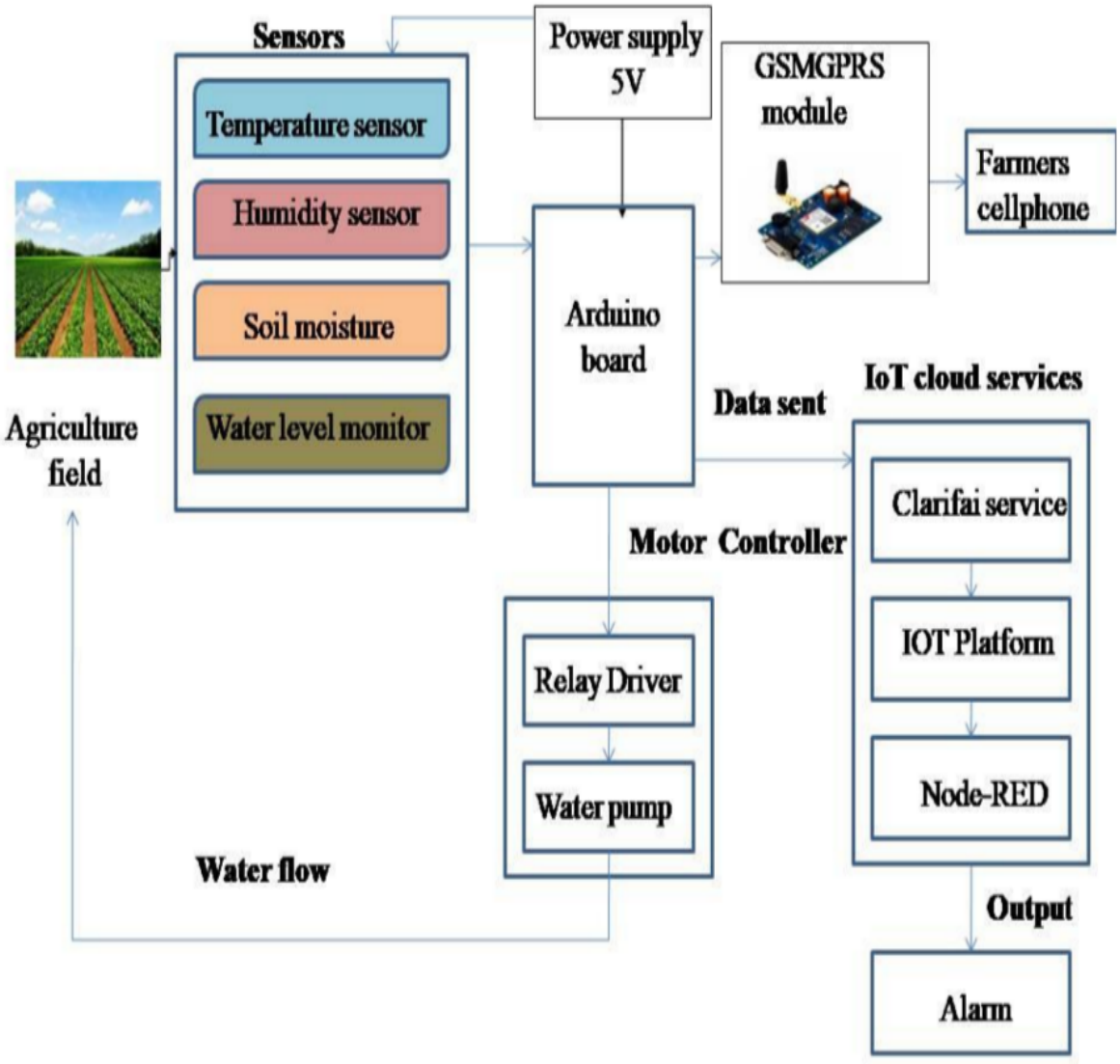
| | | |
|---|---|---|
| | | them to grow crops that will benefit in their respective region and discussion forum to communicate. |
| NFR-2 | **Security** | Guarantees that all of the data inside the system, or at least some of it will be safe from malware assaults and illegal access. |
| NFR-3 | **Reliability** | ➢ Realisability guarantees that a farmer can complete a field work quickly and also cuts down on lost time and productivity.<br>➢ Indicate the likelihood that the software will operate without error for a particular number of users or period of time. |
| NFR-4 | **Performance** | ➢ Measures the system's response time under various load scenarios.<br>➢ Regardless of the amount of data that is saved, it must offer consumers acceptable response times and must support analytics that take place in background bidirectional communication. |
| NFR-5 | **Availability** | ➢ Describes how likely the system is accessible for a user at a given point of time.<br>➢ IoT solutions and domains demand highly available systems for 24x7 operations.<br>➢ It is not a vital production application, thus if the IoT solution fails, operations or production won't be affected. |
| NFR-6 | **Scalability** | ➢ The system's integration of computer vision algorithms with IBM Cloudant services improves scalability by improving the efficiency of photo retrieval at scale.<br>➢ Determines the maximum workload that the system can handle while meeting the performance requirements. |

# 5.PROJECT DESIGN

## 5.1 Data flow Diagram



## 5.2 Solution & Technical Architecture



## 5.3 User Stories

| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
|---|---|---|---|---|---|---|
| Customer (Mobile user) | Registration | USN-1 | A user may access the web application. | I can access my account / dashboard | High | Sprint-1 |
| | | USN-2 | User credentials, including their email address and password can be registered. | I can receive confirmation email & click confirm | High | Sprint-1 |
| | Login | USN-3 | User can access the programme by entering their email and password. | I can login to my account | High | Sprint-1 |
| | Dashboard | USN-4 | User can view the temperature. | I can view the data given by the device | High | Sprint-2 |
| | | USN-5 | The user can view the sensor monitoring value level. | | High | Sprint-2 |
| | | | | | | |
| Customer (Web user) | Usage | USN-1 | An individual can access the website and obtain the data. | I can the data given by device | High | Sprint-3 |
| Customer | Working | USN-1 | User act according to the alert given by device. | I can get the data work according to it. | High | Sprint-3 |
| | | USN-2 | User turns ON the water motor/Buzzer/Sound alarm when the disturbance occur in the field | I can get the data work according to it. | | Sprint-4 |
| | | | | | | |
| Customer Care Executive | Action | USN-1 | User solve the problem when faces any usage issues. | I can solve the issues when some one fails to understand the procedure. | High | Sprint-4 |
| Administrator | Administration | USN-1 | User can store every information | I can store gained information | High | Sprint-4 |

# 6.PROJECT PLANNING AND SCHEDULING

| TITLE | DESCRIPTION | DATE |
|---|---|---|
| **Literature Survey** on The Selected Project and Information Gathering | A Literature Survey is a compilation summary of research done previously in the given topic. Literature survey can be taken from books, research paper online or from any source. | 13 September ,2022 |
| Prepare **Empathy Map** | Empathy Map is a visualization tool which can be used to get a better insight of the customer | 14 September ,2022 |
| Ideation-**Brainstorming** | Brainstorming is a group problem solving session where ideas are shared, discussed and organized among the team members. | 20 September ,2022 |
| Define **Problem Statement** | A Problem Statement is a concise description of the problem or issues a project seeks to address. The problem statement identifies the current state, the desired future state and any gaps between the two. | 21 September ,2022 |
| **Problem Solution Fit** | This helps us to understand the thoughts of the customer their likes, behaviour, emotions etc. | 11 October,2022 |
| **Proposed Solution** | Proposed solution shows the current solution and it helps is going towards the desired result until it is achieved. | 28September ,2022 |
| **Solution Architecture** | Solution Architecture is a very complex process that it has a lot of subprocesses and branches. It helps in understanding the components and features to complete our project. | 15October ,2022 |
| **Customer Journey** | It helps us to analyze from the perspective of a customer, who uses our project. | 21 October ,2022 |

| | | |
|---|---|---|
| **Functional Requirement** | Here functional and nonfunctional requirements are briefed. It has specific features like usability, security, reliability, performance, availability and scalability. | 21 October ,2022 |
| **Data Flow Diagrams** | Data Flow Diagram is a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement. | 21 October ,2022 |
| **Technology Architecture** | Technology Architecture is a more well defined version of solution architecture. It helps us analyze and understand various technologies that needs to be implemented in the project. | 21 October ,2022 |
| **Prepare Milestone & Activity List** | It helps us to understand and evaluate our own progress and accuracy so far. | 04 November ,2022 |
| **Spring Delivery Plan** | Sprint planning is an event in scrum that kicks off the sprint. The purpose of sprint planning is to define what can be delivered in the sprint and how that work will be achieved. | In Progress |

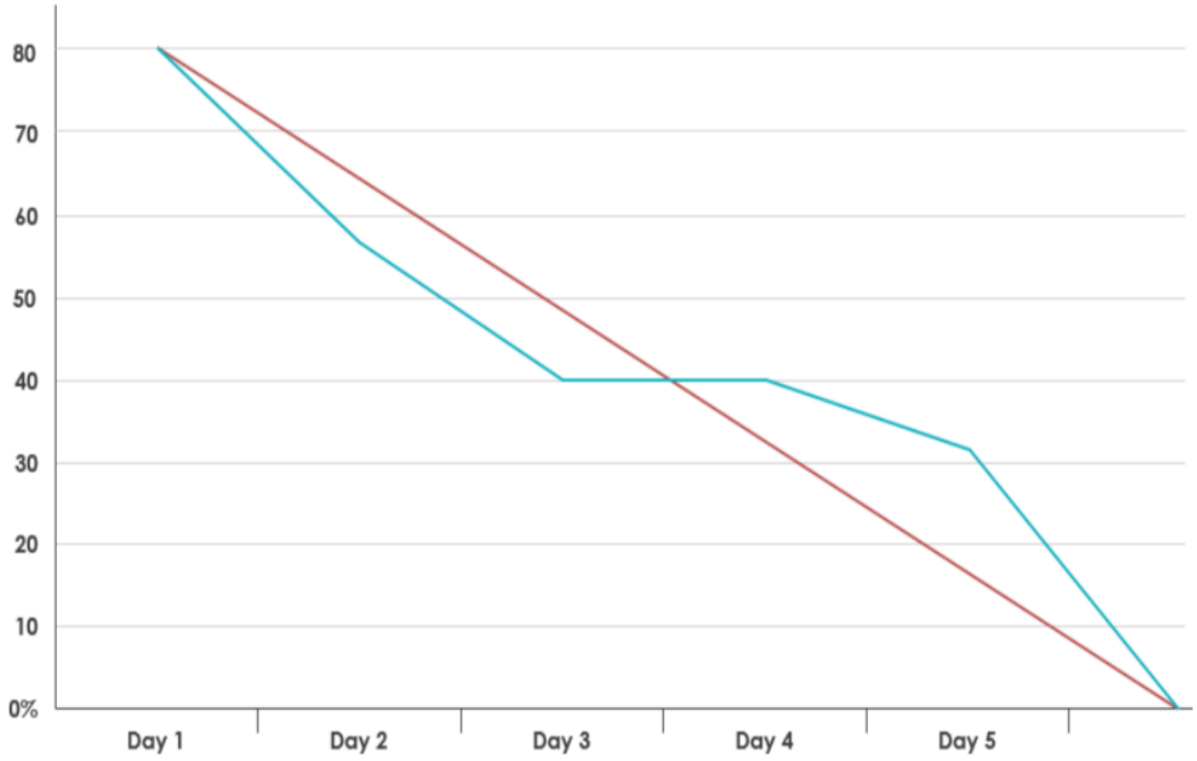
## 6.1 Sprint Planning and Estimation

| Sprint | Functional Requirement (Epic) | User story Number | User story /Task | Story points | priority | Team members |
|---|---|---|---|---|---|---|
| **Sprint -1** | Download the database | USN-1 | As a user I can register for the application by entering my email, password and confirming my password. | 2 | High | Hema |
| **Sprint -1** | Register | USN-2 | As a user I can register for the application by entering my email, password and confirming my password. | 2 | High | Kamali |
| **Sprint -2** | Login | USN-3 | As a user I will receive confirmation email once Ihave registered for the application. | 1 | Low | Kishore |
| **Sprint -1** | Upload image | USN-4 | As a user must upload the image to identify the problem and works on it. | 1 | Medium | Manikandan |

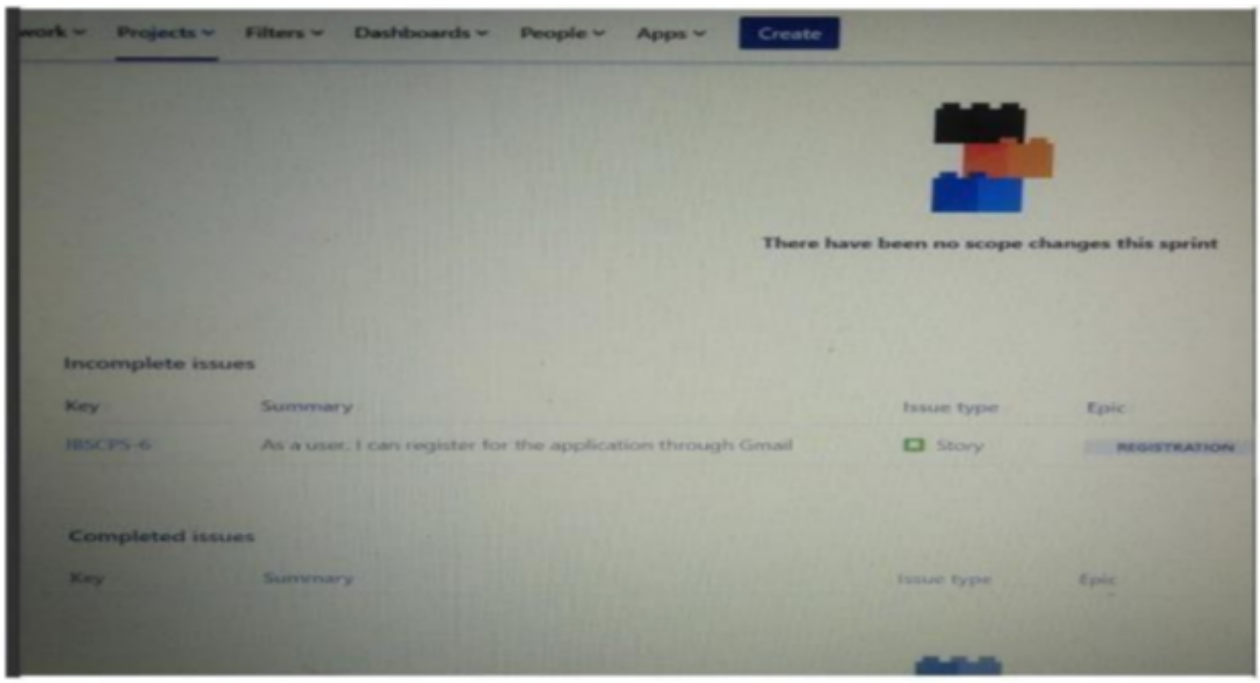
## 6.2 Sprint Delivery Schedule

| Sprint | Total Story Points | Duration | Sprint StartDate | Sprint End Date(Planned) | Story Points Completed (ason Planned End Date) | Sprint Release Date (Actual) |
|---|---|---|---|---|---|---|
| Sprint-1 | 20 | 6 Days | 24 Oct 2022 | 29 Oct 2022 | 20 | 29 oct 2022 |
| Sprint-2 | 20 | 6 Days | 31 Oct 2022 | 05 Nov 2022 | 30 | 30 oct 2022 |
| Sprint-3 | 20 | 6 Days | 07 Nov 2022 | 12 Nov 2022 | 49 | 6 nov 2022 |
| Sprint-4 | 20 | 6 Days | 14 Nov 2022 | 19 Nov 2022 | 50 | 7 nov 2022 |

Burndown Chart




## 6.3Reports From JIRA



# 7.CODING AND SOLUTIONING

## 7.1 Feature 1

```
import random
 import
ibmiotf.application import
ibmiotf.device from time import sleep import sys
#IBM Watson Device
Credentials.organization = "kd5lkd"
 deviceType = "ibm"
deviceId = "12345678"
authMethod = "use- token-auth" authToken = "87654321"
def myCommandCallback(cmd):
print("Command received: %s" % cmd.data['command'])
status=cmd.data['command']
if status=="sprinkler_on":
print ("sprinkler is ON")else : print ("sprinkler is OFF")
 #print(cmd) 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()21

#Connecting to IBM watson.
deviceCli.connect()
 while True:
#Getting valuesfrom sensors. temp_sensor = round(random.uniform(0,80),2)
PH_sensor =    round(random.uniform(1,14),3)
camera = ["Detected","Not Detected","Not Detected","Not Detected","Not Detected","NotDetected",]
camera_reading = random.choice(camera)
flame = ["Detected","Not Detected","Not Detected","Not Detected","Not Detected","NotDetected",]
flame_reading = random.choice(flame) moist_level = round(random.uniform(0,100),2)
water_level = round(random.uniform(0,30),2)
```

```
#storing the sensor data to send in json format to cloud.temp_data = { 'Temperature' : temp_sensor}
PH_data = { 'PH Level' : PH_sensor } camera_data = { 'Animal attack' : camera_reading}
flame_data = { 'Flame' : flame_reading }
moist_data = { 'Moisture Level' : moist_level}
 water_data = { 'Water Level' : water_level}
# publishing Sensordata to IBM Watson for every 5-10 seconds.
success = deviceCli.publishEvent("Temperature sensor", "json", temp_data, qos=0)sleep(1)
if success:
print (" .....publish ok..... ")
print ("Published Temperature = %s C" % temp_sensor, "to IBM Watson")
success = deviceCli.publishEvent("PH sensor", "json", PH_data,qos=0)
sleep(1)
if success:
print ("Published PH Level = %s" % PH_sensor, "to IBM Watson")
success = deviceCli.publishEvent("camera", "json", camera_data, qos=0)
sleep(1)
if success:
print ("Published Animal attack %s " % camera_reading, "to IBM Watson")
success = deviceCli.publishEvent("Flame sensor", "json", flame_data, qos=0)
sleep(1)
if success:
print ("Published Flame %s "% flame_reading, "toIBM Watson")
 success = deviceCli.publishEvent("Moisture sensor", "json", moist_data, qos=0)
sleep(1)
if success:
print ("Published Moisture Level = %s " % moist_level, "to IBM Watson")
success = deviceCli.publishEvent("Water sensor", "json", water_data, qos=0)
sleep(1)
if success:
print ("Published Water Level = %s cm"% water_level, "toIBM Watson print(“ “)

#Automation to controlsprinklers by present temperature an to send alert message to  IBM Watson.
if (temp_sensor > 35):
print("sprinkler-1 is ON")
```

```
success = deviceCli.publishEvent("Alert1", "json",{ 'alert1' : "Temperature(%s) is high, sprinkerlers are turned ON" %temp_sensor } ,qos=0)
sleep(1)
if success:print( 'Published alert1 : ', "Temperature(%s) is high, sprinkerlers are turned ON" %temp_sensor,"to IBM Watson")print("")else:
print("sprinkler- 1 is OFF")
print(" ")
#To send alert messageif farmer uses the unsafefertilizer to crops
. if (PH_sensor > 7.5 or PH_sensor < 5.5):
success = deviceCli.publishEvent("Alert2", "json",{ 'alert2' : "Fertilizer PH level(%s) is not safe,useother fertilizer" %PH_sensor } , qos=0)
sleep(1)
if success:
print('Published alert2: ' , "Fertilizer PH level(%s) is not safe,useother fertilizer"
%PH_sensor,"toIBM Watson") print("")
#To send alert message to farmer that animal attack on crops.if (camera_reading == "Detected"):
success = deviceCli.publishEvent("Alert3", "json", { 'alert3' : "Animal attackon crops detected" },qos=0)
sleep(1)
if success:
print('Published alert3 : ' , "Animal attackon crops detected","to IBM Watson","to IBM Watson")
print(" ")
#To send alert message if flame detected on crop land and turn ON the splinkers to takeimmediate action.
if (flame_reading == "Detected"):


success = deviceCli.publishEvent("Alert4", "json", { 'alert4' : "Flame is detected crops are indanger,sprinklers turned ON" }, qos=0)
sleep(1)
if success:
print( 'Published alert4 : ' , "Flame is detected crops are in danger,sprinklers turnedON","to IBM Watson")
#To send alert message if Moisture level is LOW and to Turn ON Motor-1 for irrigation.if (moist_level < 20):
print("Motor-1 is ON")
success = deviceCli.publishEvent("Alert5", "json", { 'alert5' : "Moisture level(%s)is low,
```

```
Irrigationstarted" %moist_level }, qos=0)
sleep(1)
 if success:
print('Published alert5: ' , "Moisture level(%s) is low, Irrigation started" %moist_level,"to IBMWatson")
print(" ")
#To send alert message if Water level is HIGH and to Turn ON Motor-2 to take water out.`if(water_level > 20):
print("Motor-2 is ON")
success = deviceCli.publishEvent("Alert6", "json", { 'alert6' : "Water level(%s) is high, so motor isON to take water out " %water_level }, qos=0)
sleep(1)
if success:
print('Published alert6 : ' ,"water level(%s) is high, so motor is ON to take water out "
%water_level,"to IBM Watson" )print("") #commandrecived by farmer
deviceCli.commandCallback =  myCommandCallback
# Disconnect the device and application from the clouddeviceCli.disconnect()
```

## Features

Output: Digital pulse high (3V) when triggered (motiondetected) digital lowwhenidle (no motion detected). Pulse lengths are determined by resistors and capacitors on the PCB and differfrom sensor to sensor. Power supply: 5V-12V input voltagefor most modules (they have a 3.3V regulator),but 5Vis ideal in case the regulator has differentspecs.

**BUZZER**

**Specifications**

1. RatedVoltage : 6V DC
2. Operating Voltage: 4 to 8V DC
3. Rated Current*: ≤30mA
4. SoundOutput at 10cm* : ≥85dB

Most modern ones are civil defense or air- raid sirens, tornado sirens, or the sirens on emergency service vehicles such as ambulances, police cars and firetrucks. There are two general types, pneumatic and electronic.

**7.2 FEATURE 2**

- ➤ Good sensitivity to Combustible gas in wide range.
- ➤ High sensitivity to LPG, Propaneand Hydrogen.
- ➤ Long life and low cost.
- ➤ Simple drive circuit.

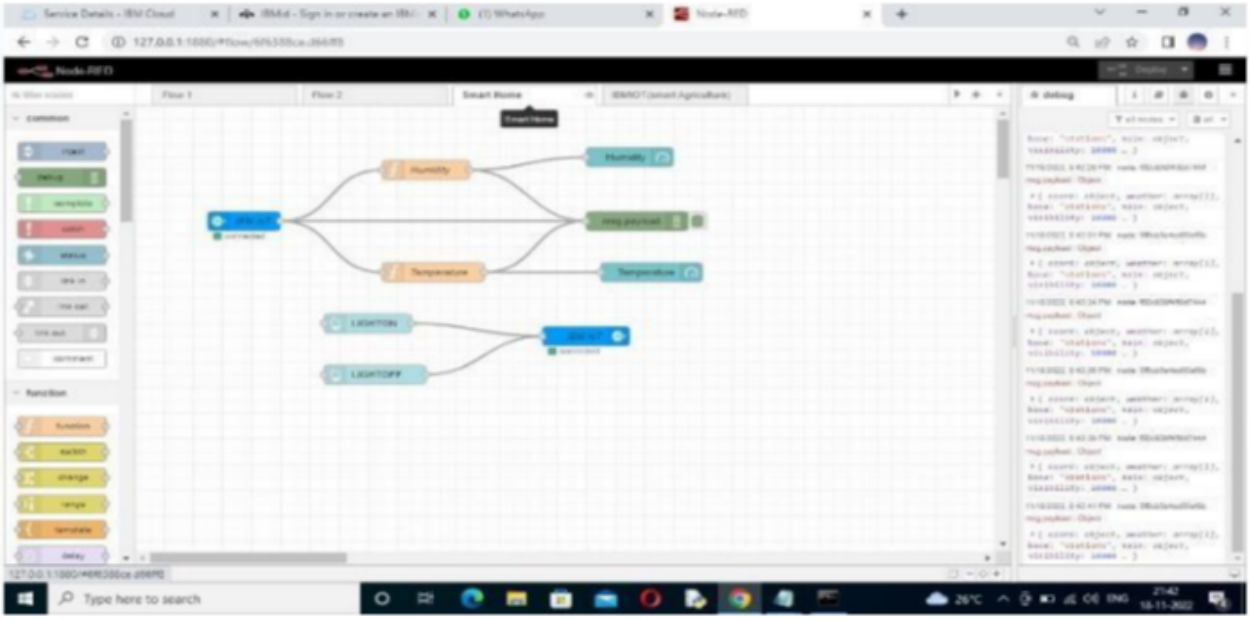
# 8.TESTING

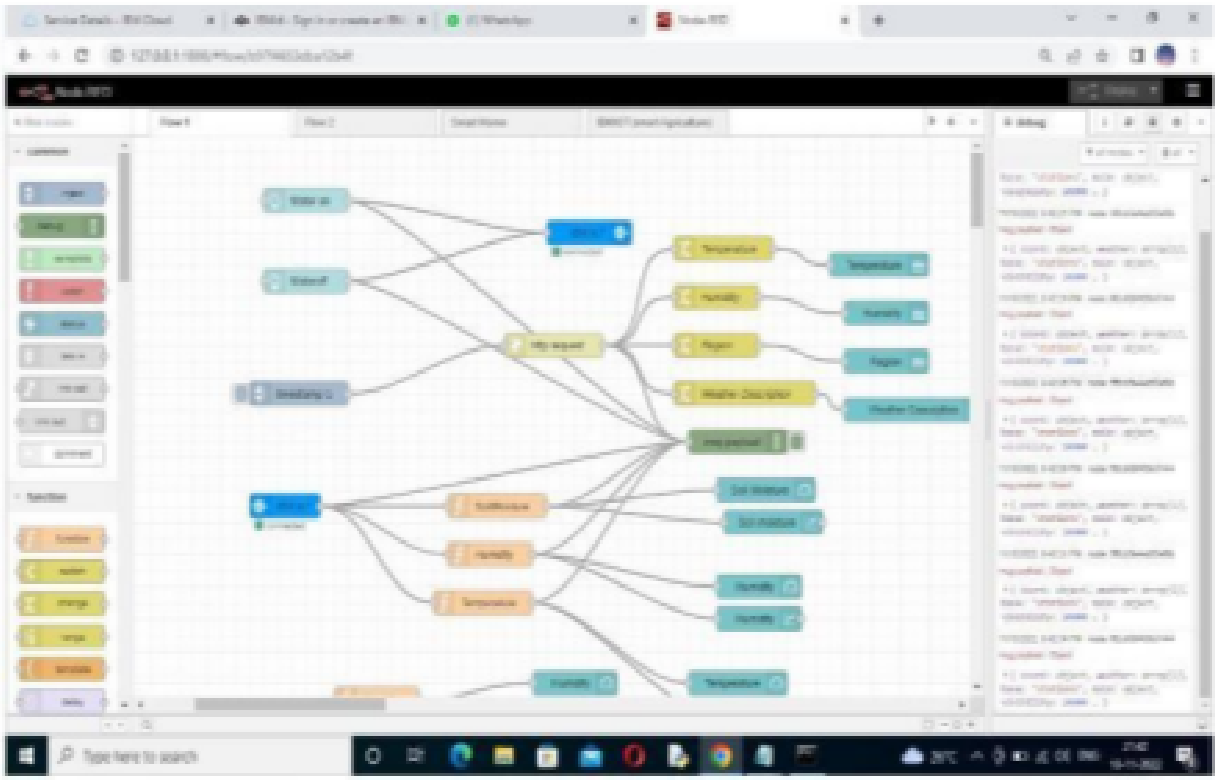
## 8.1 Test Cases

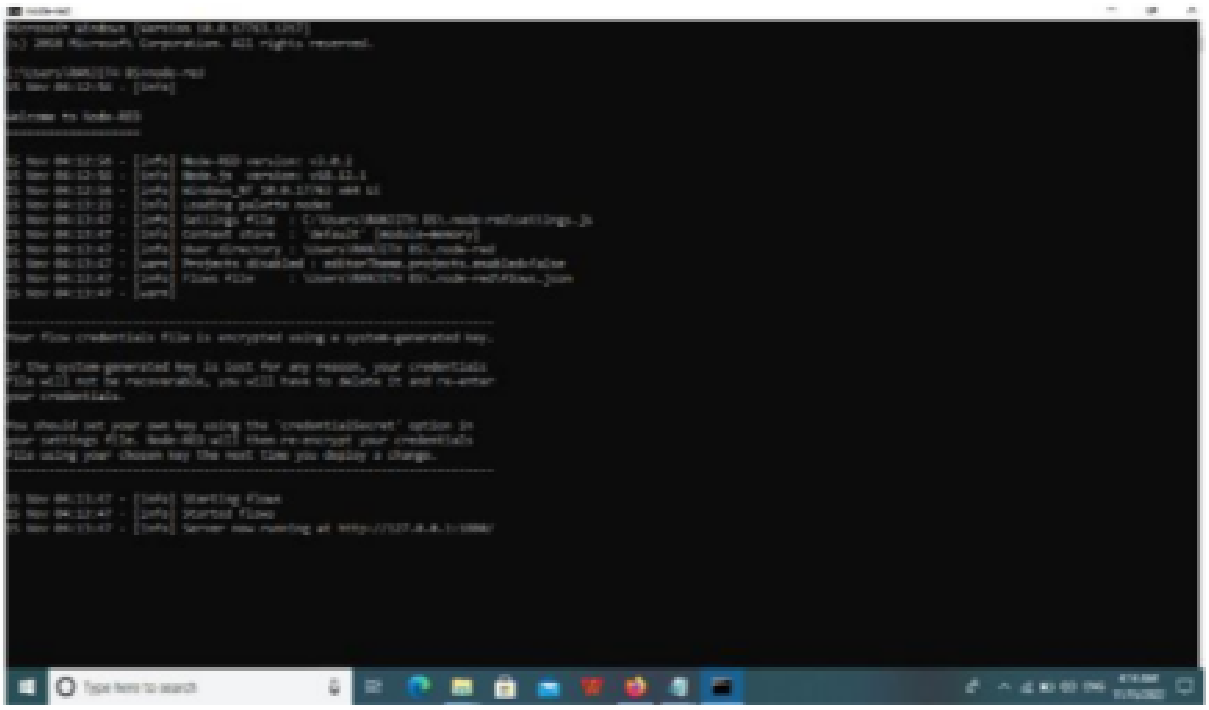
| sno | parameter | Values | Screenshot |
|---|---|---|---|
| | | | |
| 1 | Model summary | - | |
| 2 | accuracy | Training accuracy-95% Validation accuracy-72% | |
| 3 | Confidence score | Class detected-80% Confidence score-80% | |

## 8.2 User Acceptance Testing :







## 9.RESULTS

1. The problem of crop vandalization by wild animals and firehas become a major social problem in current time.

2.It requires urgent attention as no effective solution exists till date for this problem. Thus this project carries a great social relevance as it aims to address this problem. This project will help farmers in protecting their orchards and fields and save them from significant financial losses and will save them from the unproductive efforts that they endure for the protection their fields. This will also help them in achieving better cropyields thus leading to their economic wellbeing.

## 10. ADVANTAGES AND DISADVANTAGES

**Advantages :**

Controllable food supply. you might have droughts or floods, but if you are growing the crops and breeding them to be hardier, youhave a better chance of not straving. It allows farmers to maximize yields using minimum resources such as water, fertilizers.

**Disadvantages :**

The main disadvantage is the time it can take to process the information.in order to keep feeding people as the population growsyou have to radically change the environment of the planet.

## 11.CONCLUSION

A IoT Web Application is built for smart agricultural system usingWatson IoT platform, Watson simulator, IBM cloud and Node-RED.

# 12. FUTURE SCOPE

In the future, there will be very large scope, this project can be madebased on Image processing in which wild animal and fire can be detected bycameras and if it comes towards farm then system will be directly activated through wireless networks. Wild animals can also be detected by using wireless networks such as laser wireless sensors and by sensing this laser orsensor’s security system will be activated.

# 13. APPENDIX

13.1 Github

**https://github.com/IBM-EPBL/IBM-Project-22444-1659852060**