

PROJECT REPORT

IOT BASED SMART CROP PROTECTION SYSTEM FOR AGRICULTURE

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1.INTRODUCTION

1.1 Project Overview

The title of our project is “IOT BASED SMART CROP PROTECTION FOR AGRICULTURE”. The overview of our Project is 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 yield for 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 to grow better and provide better yield.

2.LITERATURE SURVEY

2.1Existing problem

1. “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 effective manner, during which they have to face some problems such as:

2. There are increasing pressures from climate change, soil erosion and biodiversity loss and from consumers’ changing tastes in food and concerns about how it is produced.

3. And the natural world that farming works with – plants, pests and diseases – continue to pose their own challenges beyond that, they have to

4. Stay resilient against global economic factors.

5. Inspire young people to stay in rural areas and become future farmers

6. 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 of water, allow weeds, pests and fungi to thrive, and can reduce crop productivity.

LITERATURE SURVEY

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 ,efficient 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 NI MULTISM simulation software is used.DIAC and TRIAC technique.	Achieves proper water management ,saves 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.

2.2References

1. [https://smartinternz.com/assets/docs/Smart%20Home%20Automation%20using%20IBM%20cloud%20Services%20\(1\).pdf](https://smartinternz.com/assets/docs/Smart%20Home%20Automation%20using%20IBM%20cloud%20Services%20(1).pdf)
2. [https://smartinternz.com/assets/docs/Smart%20Home%20Automation%20using%20IBM%20cloud%20Services%20\(1\).pdf](https://smartinternz.com/assets/docs/Smart%20Home%20Automation%20using%20IBM%20cloud%20Services%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

6. Agriculture is one of the area which required urgent attention and advancement for high yield and efficient utilisation of resources.

7. In this paper an approach smart crop monitoring is presented through Internet 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 smart crop monitoring.

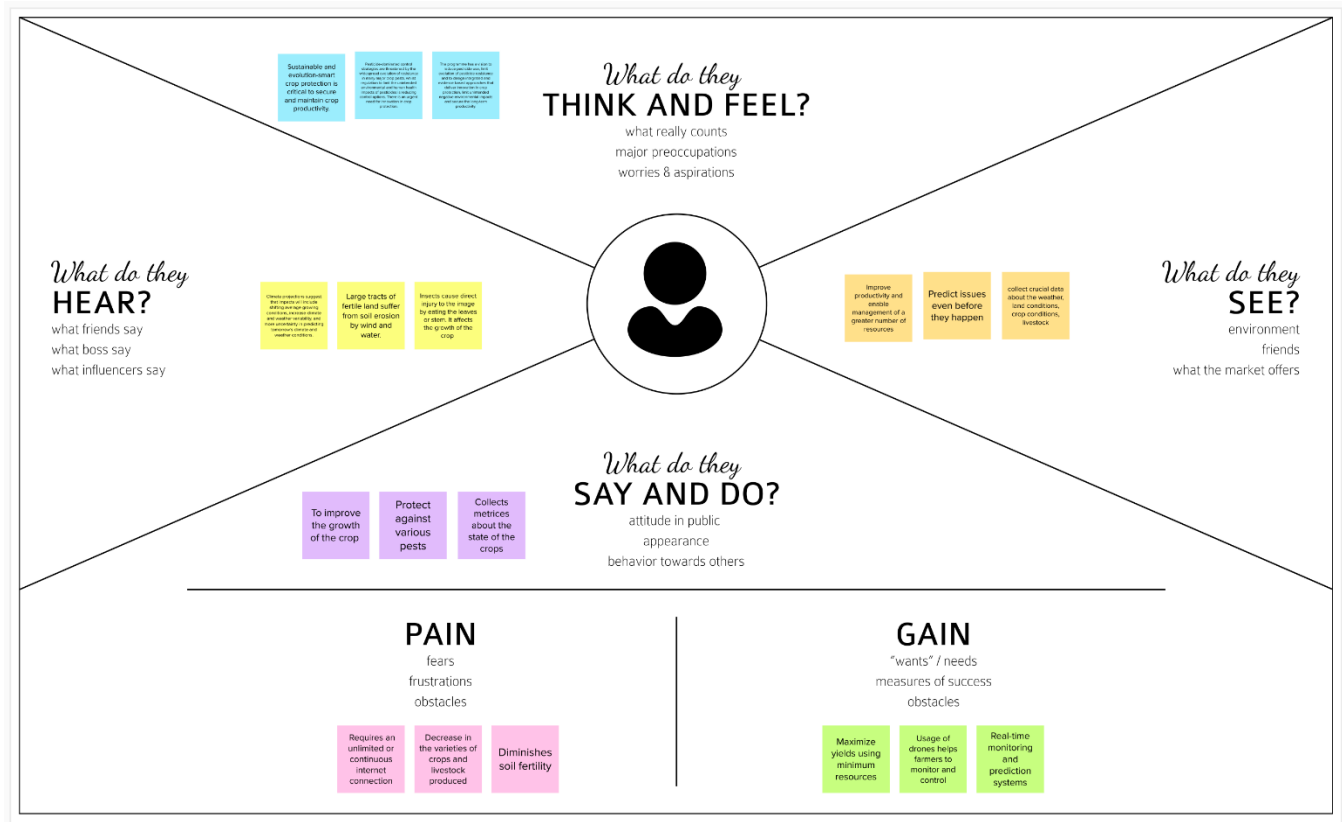
4. In this Project, Farm is going to get protected from humidity, Temperature and Animals with the help of IOT cloud module.

5. The Agricultural Farm is been monitored with the help of MIT app and then data will be collected and stored in its cloud.

6. It will monitor and sense the humidity level and movement of animals and will send the message as notification to the user.

3.IDEATION & PROPOSED SOLUTION

3.1Empathy 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 which have arisen at the dawn 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 of information in order to define ways of simplifying agricultural work. It also allows for accurate and Predictive analysis of all situations 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


Template




Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.


 **10 minutes** to prepare

 **1 hour** to collaborate

 **2-8 people** recommended

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

 **10 minutes**

A Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.


C Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#) →


1 Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

 **5 minutes**


PROBLEM


Identify the solution to know the best solution for protection of crops based on IoT.





Key rules of brainstorming


To run an smooth and productive session


 Stay in topic.

 Encourage wild ideas.

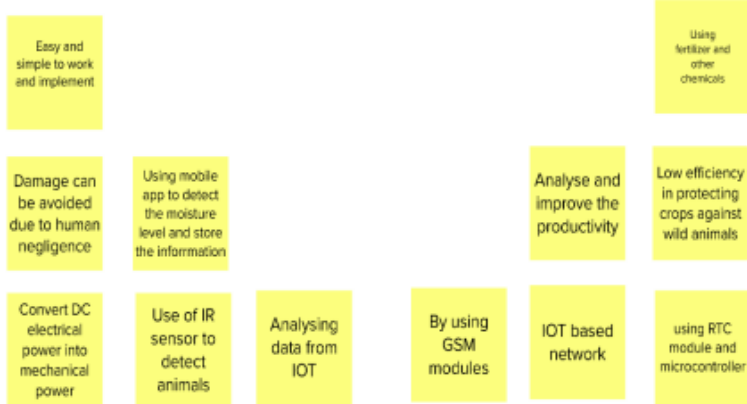
 Defer judgment.

 Listen to others.

 Go for volume.

 If possible, be visual.

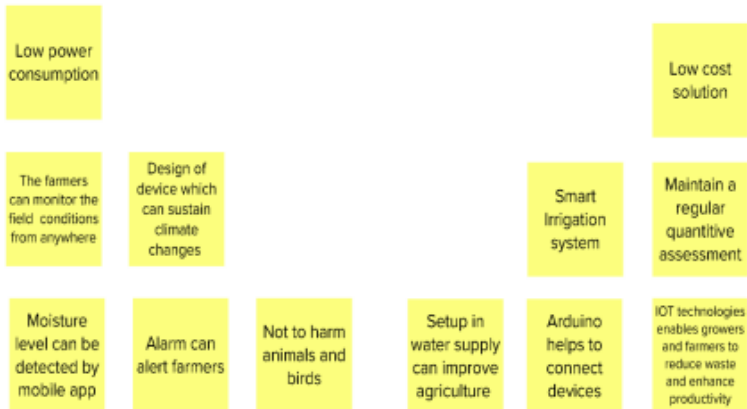
JEEVADHARSHINI



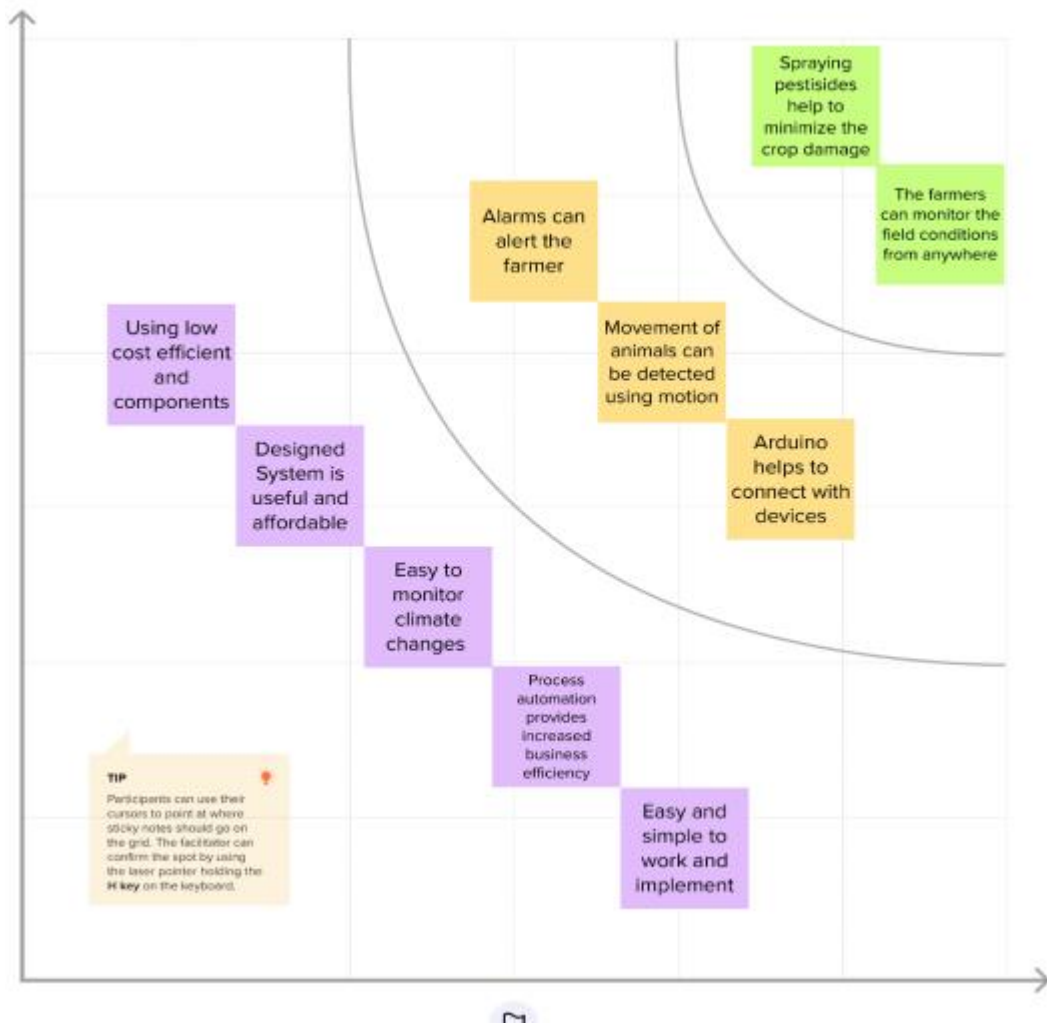
MIRUTHIKA



JEEVA



KHRUSHCHEV



3.3 PROPOSED SOLUTION:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Crops in farms are many times ravaged by local animals like buffaloes, cows, goats, birds etc.... This leads to huge losses for the farmer.
2.	Idea / Solution description	Farmers may now increase production and decrease waste thanks to sensors for light, humidity, temperature, soil moisture, etc. Furthermore, farmers may check on the state of their fields from anywhere with the aid of these sensors.
3.	Novelty / Uniqueness	Certain cultural practices can prevent or reduce insect crop damage. These include destination of crop residues, deep plowing, crop rotation, use of fertilizers, strip cropping, irrigation, and scheduled planting operation.
4.	Social Impact / Customer Satisfaction	conservation of water. greatly reduces time. a rise in production quality. Production intelligence and real-time data. remote observation.
5.	Business Model (Revenue Model)	<p>Since everyone can understand how to utilise the product, it is simple for them to do so for their safest organisation.</p> <p>The product is heavily promoted across all mediums. Due of its affordability, it even protects small farms from natural calamities.</p>
6.	Scalability of the Solution	Integration might be the use of crop residue to increase animal protection, and the use of manures to increase crop protection. Integration is a way of maximizing outputs (food for the family, farm protect for sale, ect.)and minimizing input(purchase, labour)

3.4 PROBLEM SOLUTION FIT

1. CUSTOMER SEGMENT(S) ❖ Farmers who trying to protect crops from various problems	6. CUSTOMER CONSTRAINTS ❖ Low availability of improved hybrid seed. ❖ Limited supervision ❖ Weeds can cause significant reduction in crop field if not controlled.	5. AVAILABLE SOLUTIONS ❖ Sensors provides location of crop mapping helps the farmers to identify the crops easily ❖ CCTV camera to monitor and supervise Lack of manpower. the crops ❖ Effective weed dessication and seeding must be done to increase the yield of crop.
2. JOBS-TO-BE-DONE / PROBLEMS ❖ Automatics sprinklers systems must be implemented. ❖ To monitor soil,pest,insect attacks in the fields. ❖ Requires protecting crops from wild animals attacks birds and pests	9.PROBLEM ROOT CAUSE ❖ The crops are being ravaged by animals leads to huge loss for farmer. ❖ Due to various environmental factors such as temperature climate and soil quality ❖ By using,chechemicals the soil quality is diminished and leads to annual loss.	7. BEHAVIOUR ❖ Consumes more time in cropland ❖ To predict the soil ,Humidity ,Temperature ,ph,Cattle ,Fertilization Monitoring so many things are Benefical here.In addition to agricultural use, they can alsobe used for pollution and global warming
3. TRIGGERS ❖ Farmers are able to recognise the issues and work without anyone help. ❖ By seeing surrounding cropland with installing machineries 4. EMOTIONS: BEFORE / AFTER Available technologies with low cost	10.YOUR SOLUTION ❖ Smart farming can make agriculture more profitable for the farmer. ❖ Decreasing resource inputs will save the farmer money and labor, and increased reliability of spatially explicit data will reduce risks.	8.CHANNELS of BEHAVIOUR Data Analytics helps to givedata to farmers systematically. By using IoTthe data can be stored safe and secure. Giving awareness among farmers about the Applications of the devices

4.REQUIREMENT ANALYSIS

4.1Functional Requirement

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Visibility	Sense animals nearing the crop field & sounds alarm to woo them away as well as sends SMS to farmer using cloud service.
FR-4	User Reception	The Data like values of Temperature, Humidity, Soil moisture Sensors are received via SMS.
FR-5	User Understanding	Based on the sensor data value to get the information about the present of farming land.
FR-6	User Action	Motos and sprinklers in the field can be controlled by mobile application.

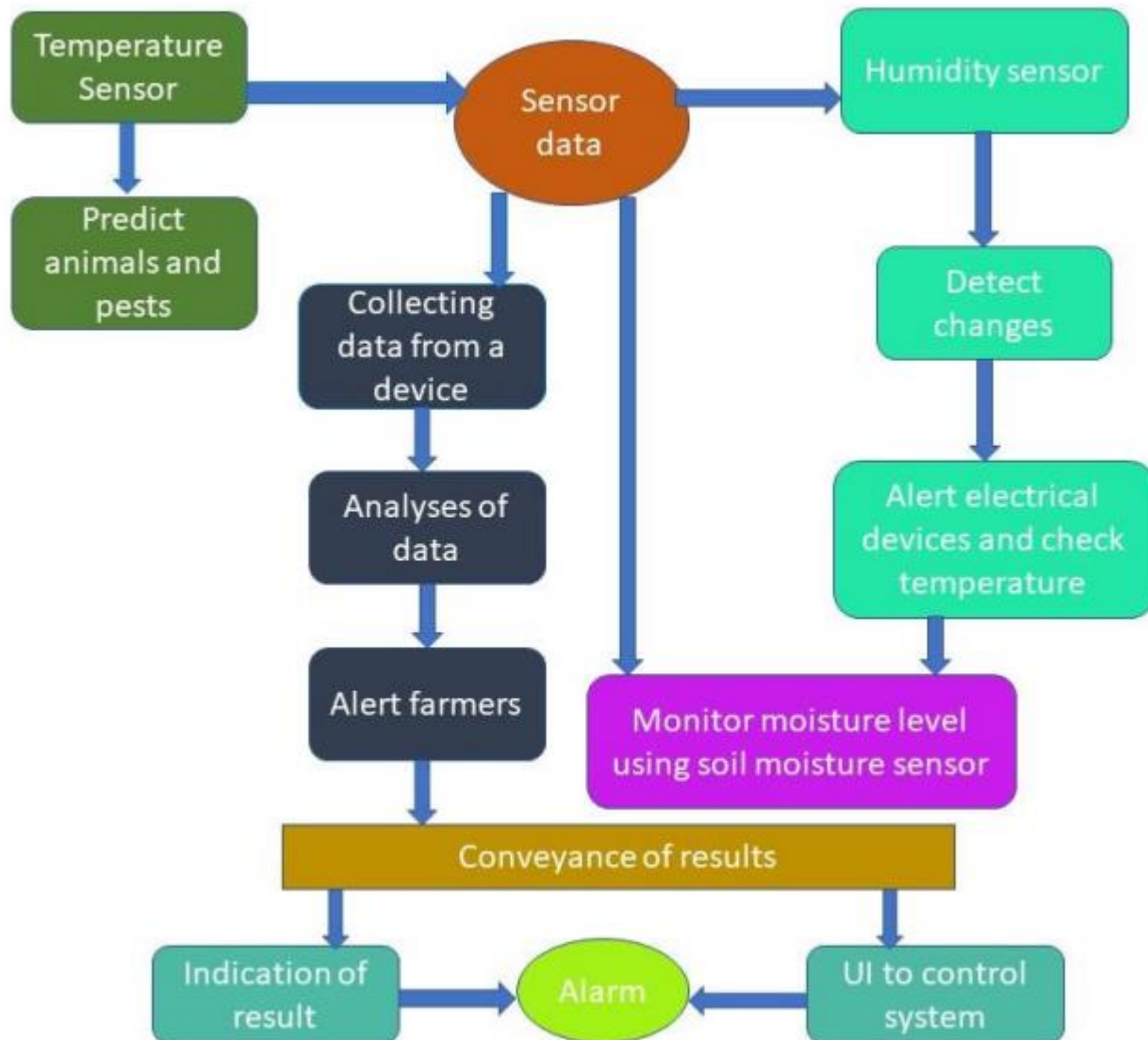
4.2Non-Functional Requirements

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Mobile Support Users must be able to interact in the same roles & tasks on computers & mobile devices where practical, given mobile capabilities.
NFR-2	Security	We have designed this project to secure the crops from animals.
NFR-3	Reliability	This project will help farmers in protecting their fields and save them from significant financial losses. This will also help them in achieving better crop yields thus leading to their economic well being.
NFR-4	Performance	Must provide acceptable response times to users regardless of the volume of data that is stored and the analytics that occurs in background. Bidirectional, near real-time

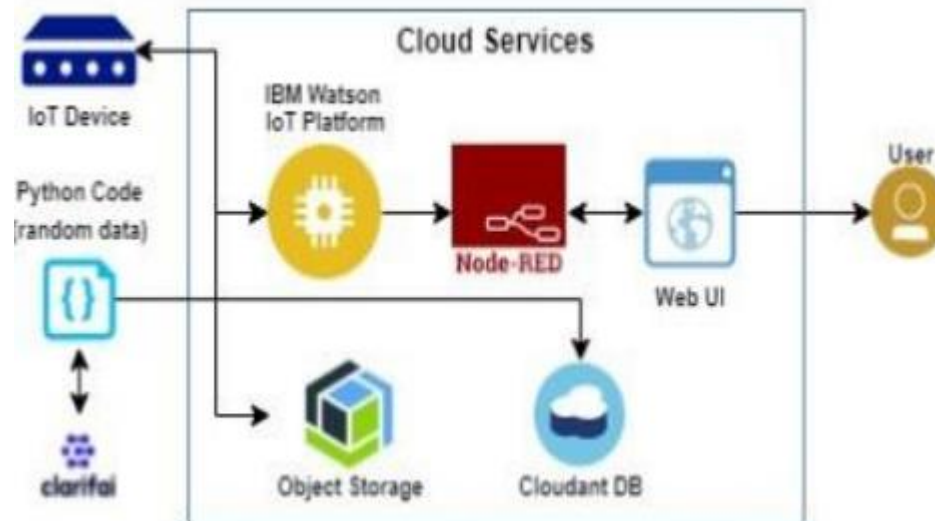
		communications must be supported. This requirement is related to the requirement to support industrial and device protocols at the edge.
NFR-5	Availability	IOT Solutions and domains demand highly available systems for 24 x 7 operations. Isn't a critical production application, which means that operations or production don't go down if the IOT solution is down.
NFR-6	Scalability	Since this system uses computer vision techniques integrated with IBM cloudant services helps efficiently to retrieve images in large scale thus improving scalability

5.PROJECT DESIGN

5.1Data flow Diagram



5.2 Solution & Technical Architecture



5.3 USER STORIES

USER STORIES:

User Type	Functional Requirement (Epic)	User Story Number	User Story/Task	Acceptance criteria	priority
Customer (Mobile user)	Download the database	USN-1	As a user I can register for the application by entering my email, password and confirming my password.	I can access my account/ dashboard	High
	Register	USN-2	As a user I can register for the application by entering my email, password and confirming my password.	I can receive confirmation email and click confirm	High
	Login	USN-3	As a user I will receive confirmation email once I have registered for the application.	I can register and access the dashboard with Facebook login	Low
	Upload the image	USN-4	As a user I must upload the image to identify the problem and works on it.		Medium
Customer (Web user)	The functional requirements are same as	Same as mobile user	Same as mobile user.	Same as mobile user	High when compare

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
Sprint 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

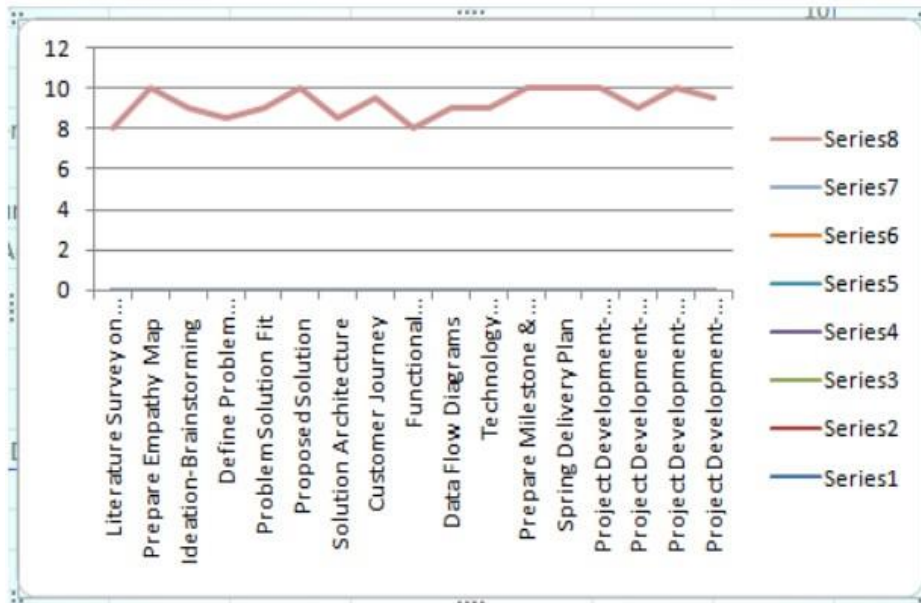
Sprint	Functional Requirement (Epic)	User story Number	User story /Task	Story points	priority	Team members
Sprint -1	Download the database	USN-1	As a user I can register for the application by entering my email, password and confirming my password.	2	High	Jeevadharshini
Sprint -1	Register	USN-2	As a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

6.2 Sprint Delivery Schedule

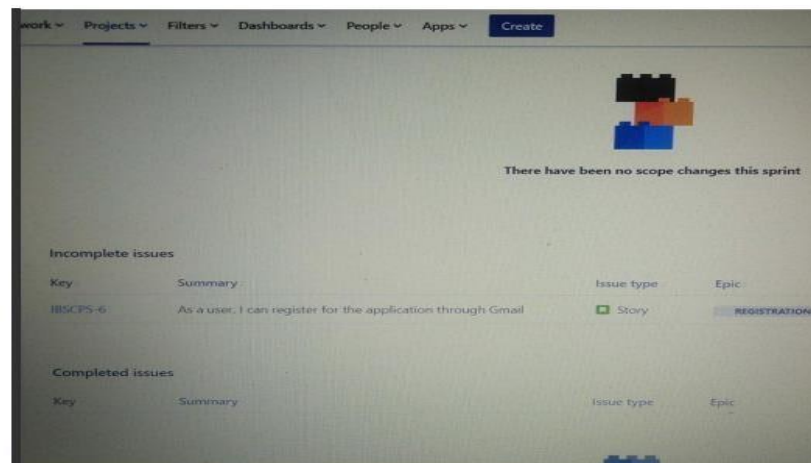
Sprint	Total Story Points	Duration	Sprint StartDate	Sprint End Date(Planned)	Story Points Completed (ason Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	30	30 oct 2022
Sprint-3	20	6 Days	07 Nov 2022	12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

Burn down Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress overtime.



6.3 Reports From JIRA



7.CODING AND SOLUTIONING

7.1 Feature 1

```

import random
import
ibmiotf.applicatio
nimport
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 values from 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 Sensor data 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, "to IBM 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) i
f success:
print ("Published Water Level = %s cm" % water_level, "to IBM  Watson print(“ “)

```

```

#Automation to control sprinklers 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 message if farmer uses the unsafe fertilizer 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,use other 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 attack on crops
    detected" },qos=0)

    sleep(1)

    if success:

    print('Published alert3 : ', "Animal attack on 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)

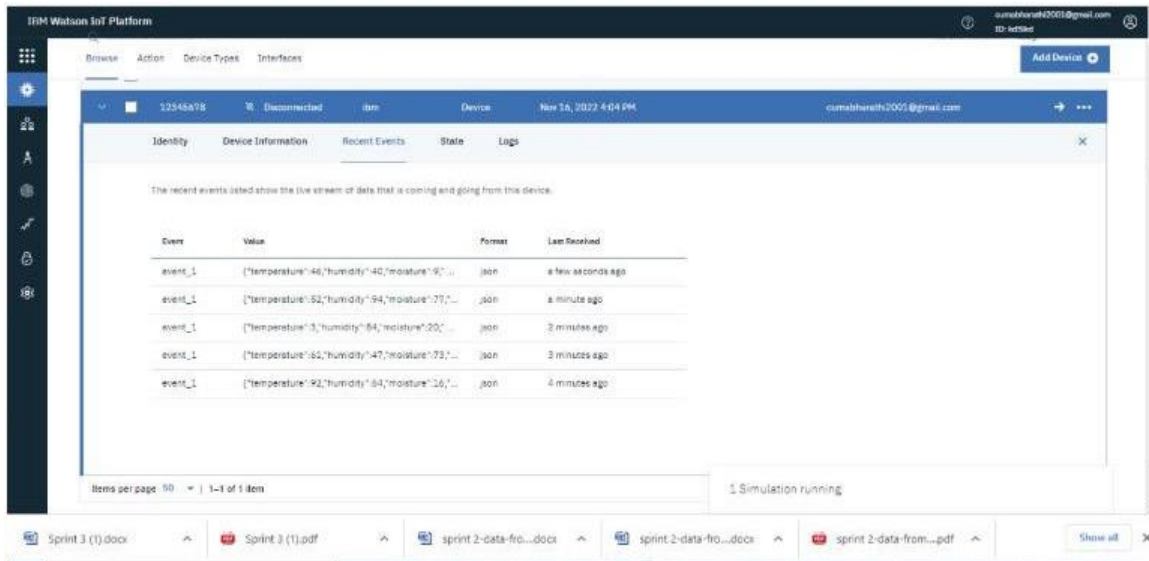
if success:

print('Published alert6 : ', "water level(%s) is high, so motor is ON to take water out "
%water_level,"to IBM
Watson" )print("")

#command recived by farmer
deviceCli.commandCallback =
myCommandCallback

# Disconnect the device and application from
the clouddeviceCli.disconnect()

```



Features

Output: Digital pulse high (3V) when triggered (motion detected) digital low when idle (no motion detected). Pulse lengths are determined by resistors and capacitors on the PCB and differ from sensor to sensor. Power supply: 5V-12V input voltage for most modules (they have a 3.3V regulator), but 5V is ideal in case the regulator has different specs.

BUZZER

Specifications

- Rated Voltage : 6V DC
- Operating Voltage : 4 to 8V DC
- Rated Current*: $\leq 30\text{mA}$
- Sound Output at 10cm* : $\geq 85\text{dB}$

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, Propane and Hydrogen .

Long life and low cost.

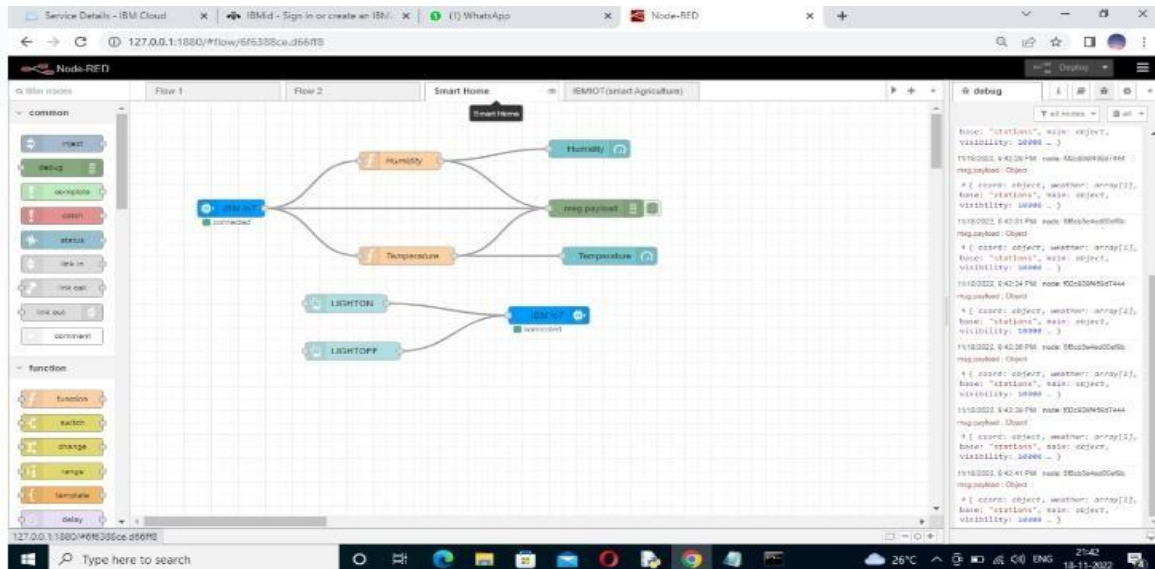
Simple drive circuit.

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:




```

Codedred
Microsoft Windows [Version 10.0.17763.1237]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\RANDITH>BS-node-red
15 Nov 04:12:56 - [info]

Welcome to Node-RED
=====

15 Nov 04:12:56 - [info] Node-RED version: v3.0.2
15 Nov 04:12:56 - [info] Node.js version: v18.12.1
15 Nov 04:12:56 - [info] Windows_NT 10.0.17763 x64 LE
15 Nov 04:13:23 - [info] Loading palette nodes
15 Nov 04:13:47 - [info] Settings file : C:\Users\RANDITH\BS\node-red\settings.js
15 Nov 04:13:47 - [info] Context store : 'default' [module=memory]
15 Nov 04:13:47 - [info] User directory : \Users\RANDITH\BS\node-red
15 Nov 04:13:47 - [warn] Projects disabled : editorTheme.projects.enabled=false
15 Nov 04:13:47 - [info] Flows file : \Users\RANDITH\BS\node-red\flows.json
15 Nov 04:13:47 - [warn]

-----
Your flow credentials file is encrypted using a system-generated key.

If the system-generated key is lost for any reason, your credentials
file will not be recoverable, you will have to delete it and re-enter
your credentials.

You should set your own key using the 'credentialSecret' option in
your settings file, Node-RED will then re-encrypt your credentials
file using your chosen key the next time you deploy a change.
-----

15 Nov 04:13:47 - [info] Starting flows
15 Nov 04:13:47 - [info] Started flows
15 Nov 04:13:47 - [info] Server now running at http://127.0.0.1:1880/

```

9.RESULTS

1. The problem of crop vandalization by wild animals and fire has 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 of their fields. This will also help them in achieving better crop yields thus leading to their economic wellbeing.

10. ADVANTAGES AND DISADVANTAGES

Advantage:

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

Disadvantage:

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

11.CONCLUSION

A IoT Web Application is built for smart agricultural system using Watson 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 made based on Image processing in which wild animal and fire can be detected by cameras 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 or sensor's security system will be activated.

11.APPENDIX

Github : <https://github.com/IBM-EPBL/IBM-Project-22440-1659852031>