KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY

PROJECT REPORT

IOT BASED SMART CROP PROTECTION SYSTEM FOR AGRICULTURE

TEAM ID:PNT2022TMID32051

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1.INTRODUCTION

1.1 PROJECT OVERVIEW

Agricultural productivity plays a major role in an Indian economy; therefore the disease detection in the field of agriculture is important. Farmers struggle a lot for proper crop production due to multiple diseases affecting the plant so there is a need to detect the disease at initial stage. Agriculture is also a beneficiary factor for living beings because it forms the food security. To get a better crop, the most important things that should be there in the land that has accurate fertilizer, better irrigation facilities and best methods for cultivation. An adequate amount of fertilizer can help plants to produce better yield and quantity to meet the needs of world economy that is increasing the raise in need of food and its production. Over 58% of the rural population depends on agriculture for their livelihood and its export constitutes 10% of the country's exports so, the farmers and even the nation's economy will be reduced if there are no proper yields due to lack of knowledge of the soil nature and unavailability of water. Therefore, the Indian government must take precautions for better and profitable agriculture. It fluctuate Control of the entire deployed framework in a single system. Which will make it simple to deal with and better understanding the results by users Just as it keeps the farmer updated by the notifications for almost every related event that happens in the field It mainly focuses on the sensors. Our system using Arduino and various sensors to monitor the different stages of plant cropping like moisture, Temperature, Humidity, pH value and Nutrients of the soil. It helps the processing, transmission, and reception of data between sensors and the Microcontroller. The main purpose of this project is to lower the cash and farming fee and also save electricity, protecting the soil from harmful chemicals and fertilizers, reducing the wastage of water and increasing the productivity of crop. Extravagant use of resources such as Water and Electricity IoT-based weather monitoring systems in farming help calculate the required supply of chemicals, nutrients, and water to produce high-quality crop yields. Moreover, agriculture products made using IoT monitoring systems can also fulfill market specifications more than other available products.

1. To protect the crops from heavy rain fall and increase the yield.

2. Generation of power using solar energy.

3. Protect cops using Green house technique.

4. To control operations regarding to closing and opening of Roof and other operations manually through IOT technology.

1.2 PURPOSE

The purpose of SCPS is to secure or protect the farm from the theft in the farm or main purpose of this project is to alert the farmer as well as fear the animals with getting harm to animals. Smart farming **reduces the ecological footprint of farming**. Minimized or site-specific application of inputs, such as fertilizers and pesticides, in precision agriculture systems will mitigate leaching problems as well as the emission of greenhouse gases. Smart farming **helps farmers to better understand the important factors such as water, topography, aspect, vegetation and soil types**. This allows farmers to determine the best uses of scarce resources within their production environment and manage these in an environmentally and economically sustainable manner. The role of crop protection in an integrated system is, additional to all the other methods, **to efficiently control the residual harmful species, with minimal use of well selected pesticides**. ICP focuses on the real problems, namely the residual ones after all other methods are designed and optimised.

Prevents weed growth and acts as barrier to soil pathogens. Accelerates uptake of micro nutrients from the soil by the active root zone Conserves soil moisture thereby reduces the irrigation water requirement of the crop. Enhances quality of the product with cleaner crop In short, an adequate, reliable food supply cannot be guaranteed without the use of crop protection products **control insects, diseases, weeds, fungi and other undesirable pests**.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

Humidity can be the most difficult environment factor to control in greenhouses. Even the most sophisticated environmental control equipment cannot perfectly control the humidity level in greenhouses. Humidity levels fluctuate with change in air temperature and plants are constantly transpiring, which adds water vapour to the air. In the northern climatic areas, these challenges are multiplied by many factors, of which the drier, outdoor air that is too cold to perform air exchanges.

Humid air directly contributes to problems such as foliar and root diseases, slow drying of the growing medium, plant stress, loss of quality, loss in yields, etc. Therefore, more pesticides are needed for disease control and plants tend to have weak, stretched growth making the plant less desirable.

If the humidity is too low, plant growth is often compromised as crops take much longer to obtain the saleable size. Also, lower leaves often drop off, growth is hard, and overall quality is not very good. Whether the humidity is too high or too low, the loss of quality reduces the selling price of crops and increases production costs, both of which reduce profits. Climate change can disrupt food availability, reduce access to food, and affect food quality. For example, projected increases

in temperatures, changes in precipitation patterns, changes in extreme weather events, and reductions in water availability may all result in reduced agricultural productivity.

Most field crops are dependent solely upon weather to provide life-sustaining water and energy. Livestock are also dependent upon weather for their comfort and food supplies. Occasionally, adverse weather conditions can cause production losses, especially if experienced during critical stages of growth. Partial root loss would result in lower plant performance and lower crop yields. Excessively wet conditions can negatively affect crop production in other ways. Abnormally high amounts of rain can leach nutrients, especially nitrogen, from the soil.

2.2REFERENCES

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2.3 PROBLEM STATEMENT DEFINITION

While humidity affects nearly all processing environments, some are more susceptible than others when it comes to humidity-related damage. For example, hygroscopic items such as dry foods and confectionery products naturally absorb moisture from the surrounding air. In addition to changing the product’s consistency and ease of processing, excess moisture can lead to reduced quality and shorter shelf-life. Insufficient humidity levels can also be detrimental to product quality, creating issues such as cracking, fragility, and degradation to prevent these issues, manufacturers must implement humidity control strategies aimed at preserving product integrity and optimizing the performance of the processing equipment. Effective humidity control includes monitoring the environment’s relative humidity, which refers to the amount of moisture present in the air at a given temperature relative to the maximum amount possible at that same temperature.

In industrial processing facilities, even minor fluctuations in humidity can necessitate costly and time-consuming procedural modifications. Maintaining optimal humidity levels in these environments is essential for maximizing production while ensuring an appealing and high-quality final product. Humidity control is particularly important when processing items that naturally absorb moisture from their surroundings. When controlling moisture in a building normally a good first step is the addition of a central HVAC system. Air conditioning will remove some moisture while providing a pleasant working environment for workers. When the addition of air

conditioning does not provide the desired result, a dedicated industrial dehumidification system is needed.

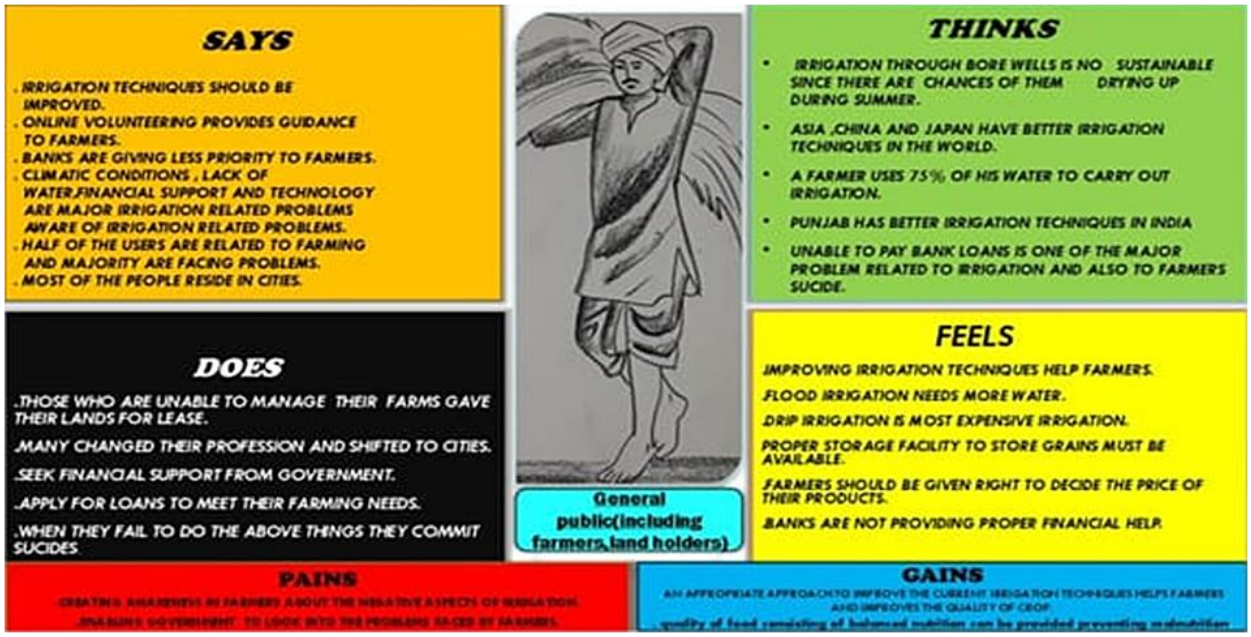
One element often overlooked is the building integrity itself. A good thing to remember is that air passes freely through building walls and the rise and fall of humidity indoors follows closely outdoor humidity changes.

A tight building with a non-permeable vapour barrier in the walls and ceiling is a must. Well-sealed windows and doors are also important. Well-sealed doors and windows minimize air infiltration from the outdoors. If a building exhaust fan is in place, the replacement outdoor makeup air entering the building adds additional moisture that has to be considered. Many times the addition of a dedicated outdoor makeup dehumidifier is a solution.

If moist air is constant all year or takes over in summer, manufacturers often struggle to maintain consistent room moisture. Even with air conditioning, relative humidity can rise to unacceptable levels for equipment operation and product integrity. The only solution is to add a dedicated dehumidification system to remove unwanted moisture while maintaining the desired room air temperature.

3. IDEATION &PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



HUMIDITY AFFECTS THE CROP:

Humidity can be the most difficult environment factor to control in greenhouses. Even the most sophisticated environmental control equipment cannot perfectly control the humidity level in greenhouses. Humidity levels fluctuate with change in air temperature and plants are constantly transpiring, which adds water vapor to the air. In the northern climatic areas, these challenges are multiplied by many factors, of which the drier, outdoor air that is too cold to perform air exchanges Humid air directly contributes to problems such as foliar and root diseases, slow drying of the growing medium, plant stress, loss of quality, loss in yields, etc. Therefore, more pesticides are needed for disease control and plants tend to have weak, stretched growth making the plant less desirable .If the humidity is too low, plant growth is often compromised as crops take much longer to obtain the saleable size. Also, lower leaves often drop off, growth is hard, and overall quality is not very good. Whether the humidity is too high or too low, the loss of quality reduces the selling price of crops and increases production costs, both of which reduce profits.

CROP PRODUCTION FROM HUMIDITY:

Relative humidity (RH) directly influences the water relations of plant and indirectly affects leaf growth, photosynthesis, pollination, occurrence of diseases and finally economic yield. Keeping

the stomata open for photosynthesis is extremely important. By keeping the humidity in the greenhouse and around the plant at the right level, the plant can keep its stomata open. Then CO2can be absorbed and the plant temperature can be regulated through evaporation.

ORGANIC AGRICULTURE:

Organic Agriculture is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects.

BIODIVERSITY:

Support local and regional projects aimed at tackling biodiversity loss. Buying fewer products and making sure the products you do buy minimize the impact on biodiversity. Investing in ways that promote biodiversity. Reducing waste of consumer goods, food, clothes, electrical appliances, etc.

3.2 IDEATION & BRAINSTORMING:

3.2.1 DEFINE PROBLEM STATEMENT

Nowadays humidity affects the crop health and growth it leads to loss of economy for our country. Crops in the farms are many times devastated by the wild as well as domestic animals and low productivity of crops is one of the reasons for this. It is not possible to stay 24 hours in the farm to guard the crops.

An intelligent crop protection system helps the farmers in protecting the crop from the animals and birds which destroy the crop. This system shall also include remote monitoring and control of pump to avoid the farmer to visit the farm in nighttime.

3.2.2 BRAINSTORM

This is our idea that come to mind and address our problem statement.

SARANYA S

1. Alert of Animals and fire using Arduino
2. Used to indicate the farmer by using sensor

3. Arduino and GSM international
4. Detection system in farm areas

BHAVYA S

1. Birds using sound technology
2. Animal instruction
3. Crop security
4. Farm monitoring and security

POOVARASHAN

1. Neural networks based image
2. Metal detect based smart protection
3. Agriculture using crop for cloud and iot
4. Alert fencing system using GSM

RENGENAATHAN

1. Automatic light control
2. Sensors and drones
3. Data mining techniques
4. Security using machine learning

3.2.3 GROUP IDEAS

1. Crop security

2. Used to indicate the farmer by using sensor
3. Birds using sound technology
4. Animal instruction
5. Sensors and drones
6. Automatic light control

CROP DETECTION

1. Detecting the moisture level of the soil.
2. Detecting the type of crop.
3. Analyzing and predict rainfall by apps.

COLLECTING INFORMATION

1. Data from IOT.
1. Data through website

DATA

1. We are storing the data in cloud.
2. The data are safe and secure.
3. We can use the data for emergency purpose.

3.2.4 PRIORITIZE

3.3 PROPOSED SOLUTION

Solution Requirements

1. Safety of people & animal
2. Low-cost solutions, lower dependency on power
3. Simple solution to suite the farmer community

Social Impact

1. Improve the productivity, Save lives of farmers

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Crops in the farm are many times devastated by the wild as well as domestic animals and low productivity of crops is one of the reasons for this. It is not possible to stay 24 hours in the farm to guard the crops.An intelligent crop protection system helps the farmers in protecting the crop from the animals and birds which destroy the crop.This system shall also include remote monitoring and control of pump to avoid the farmer to visit the farm in nighttime.
2.	Idea / Solution description	Safety of people and animals, Low-cost solutions,lower dependency on power,Simple solution to suite the farmer community. System that is built for monitoring the crop field with the help of sensors (light, humidity, temperature, soil moisture, crop health, etc.) The processes like pest control, fertilizing, and irrigation are increasingly becoming automated, and farmers can control them remotely. The use of smart IoT sensors can maintain these processes, increasing crop production
3.	Novelty / Uniqueness	The SCPS work on the battery so that this project can be easily portable and also we are add solar panels and converter modules this can help the battery to charge from solar energy. The IOT device is used to indicate the farmer by a message while someone enter into the farm and we are used SD card module that helps to store a specified sound to fear the animals.the announcement of the threshold rate will be sent to the cell number or to the website. The result will be generated on a catalog of the mobile of the person to take the necessary action.

4.	Social Impact / Customer Satisfaction	Improve the productivity,,Save lives for Farmers/help to farmer for to protect his farm Increased production: the optimisation of all the processes related to agriculture and livestock-rearing increases production rates.
5.	Business Model (Revenue Model)	Community based solution by FAO's solution through contract farming
6.	Scalability of the Solution	This project is smart crop protection system for protect the farm from animals as well as unknown person. This projects contents ardiuno UNO, Nodemcu, LCD display, PIR sensor,flame sensor,sd card module,solar panal,solar charges converter. This whole project is work on 12v dc supply from battery. We used solar panel to charge the battery.

3.4 PROBLEM SOLUTION FIT

1. CUSTOMER SEGMENT(S):

Farmer who wants to monitor their crops with humidity level

2. JOBS-TO-BE-DONE/PROBLEMS:

Crops in the farm are many times devastated by the wild as well as domestic animals and low productivity of crops is one of the reasons for this. It is not possible to stay 24 hours in the farm to guard the crops-An intelligent crop protection system helps the farmers in protecting the crop from the animals and birds which destroy the crop. This system shall also include remote monitoring and control of pump to avoid the farmer to visit the farm in nighttime.

3. TRIGGERS:

Without food, we could not survive as the provider of food it is a cornerstone of human existence.

4. EMOTIONS: BEFORE/AFTER

Common farm stressors are finances, daily hassles, and lack of control over the weather, heavy work overloads, and conflict in relationships

BEFORE: The agricultural cycle is the annual cycle of activities related to the growth and harvest of a crop (plant). These activities include loosening the soil, seeding special watering, moving plants when they grow bigger, and harvesting among others. Without these activities, a crop cannot be grown.

AFTER: After harvest, farmers might work stalks into the around, chop them for livestock, let cattle graze them in the field or leave them completely undisturbed, allowing com residue to cover the field.

5. AVAILABLE SOLUTIONS:

System that is built for monitoring the crop field with the help of sensors and automating the irrigation system the processes like pest control fertilizing, and irrigation are increasingly becoming automated, and farmers can control them remotely. The use of smart b sensors can maintain these processes, increasing crop production the announcement of the threshold rate will be sent to the cell number or to the website. The result will be generated on a catalog of the mobile of the person to take the necessary action.

6. CUSTOMER CONSTRAINTS:

Lack of proper irrigation facilities, production machinery, and access to institutional credit, difficulties procuring inputs and storing products, and negative impacts of climate

7. BEHAVIOUR:

Largely questionnaire-based methodology that focuses on the motives, values and attitudes that determine the decision-making processes of individual farmers

8. CHANNELS of BEHAVIOUR:

ONLINE involve and engage small farmers to work with an online platform to sell their products.

OFFLINE: Farmers sell their products directly to consumers through several outlets Farmer-to-consumer direct marketing is a way by which farmers sell their products directly to consumers

9. PROBLEM ROOT CAUSE:

Crop invasions by animals are a common and serious problem that causes major losses. Buffaloes, pigs, goats, birds, and fire have all caused damage to farm crops in the past.

10. YOUR SOLUTION:

System that is built for monitoring the crop field with the help of sensor The IOT device in used to indicate The farmer by a message while someone enter into the Farm and we are used SD card module that helps to Store a specified sound to fear the animals. The announcement of the threshold rate will be sent to the cell number or to the website. The result will be generated on a catalog if the mobile of the person to take the necessary action.

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Install the app. Signing up with Gmail or phone numbers. Creating a new profile. Understand the guidelines which we given
FR-2	User Confirmation	Email or phone number verification required via OTP.
FR-3	Accessing datasets	The data like values of temperature, data sensor, humidity, soil moisture are received by alert SMS.
FR-4	Interface sensor	Connect the sensor and the application When animals enter the field, the alarm is generated.
FR-5	User action	The user needs to take action like detecting through crop rotation, fertilizer, strip cropping.

Non-functional Requirements:

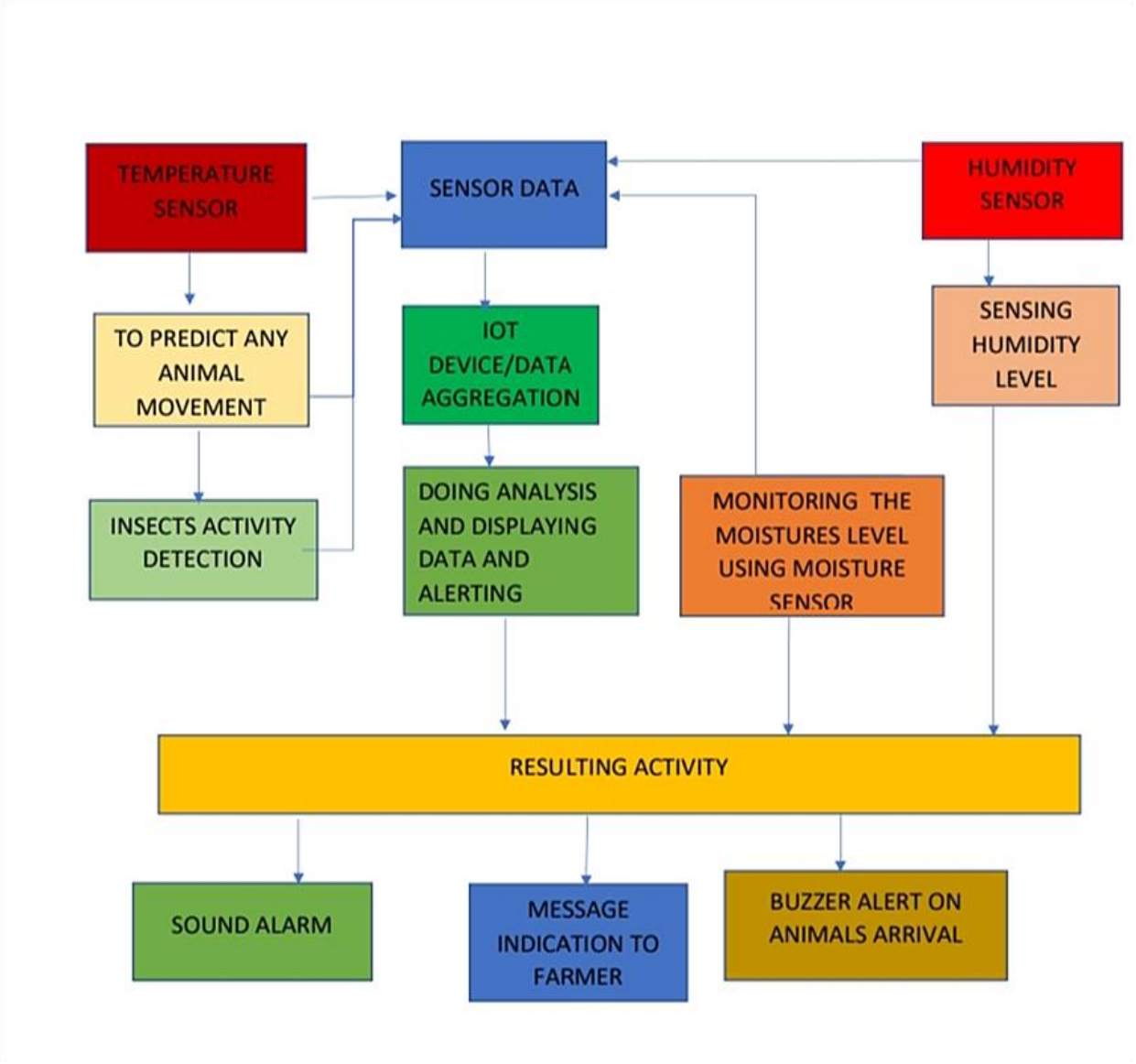
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	This project's contributors to the farm protection through the smart protection system and use new technologies and also increase the quality of its crop.

NFR-2	**Security**	It was created to protect the crops from animals.
NFR-3	**Reliability**	Farmers are able to safeguard their lands by help of this technology. They get some good benefits from higher crop yields.
NFR-4	**Performance**	When animals attempt to enter the crop field, IOT devices and sensors alert the farmer via message and maintain good yields.
NFR-5	**Availability**	Agriculture fences are quite an effective wild animal protection system.
NFR-6	**Scalability**	The develop system will not harmful and injurious to animals as well as human beings through the system.

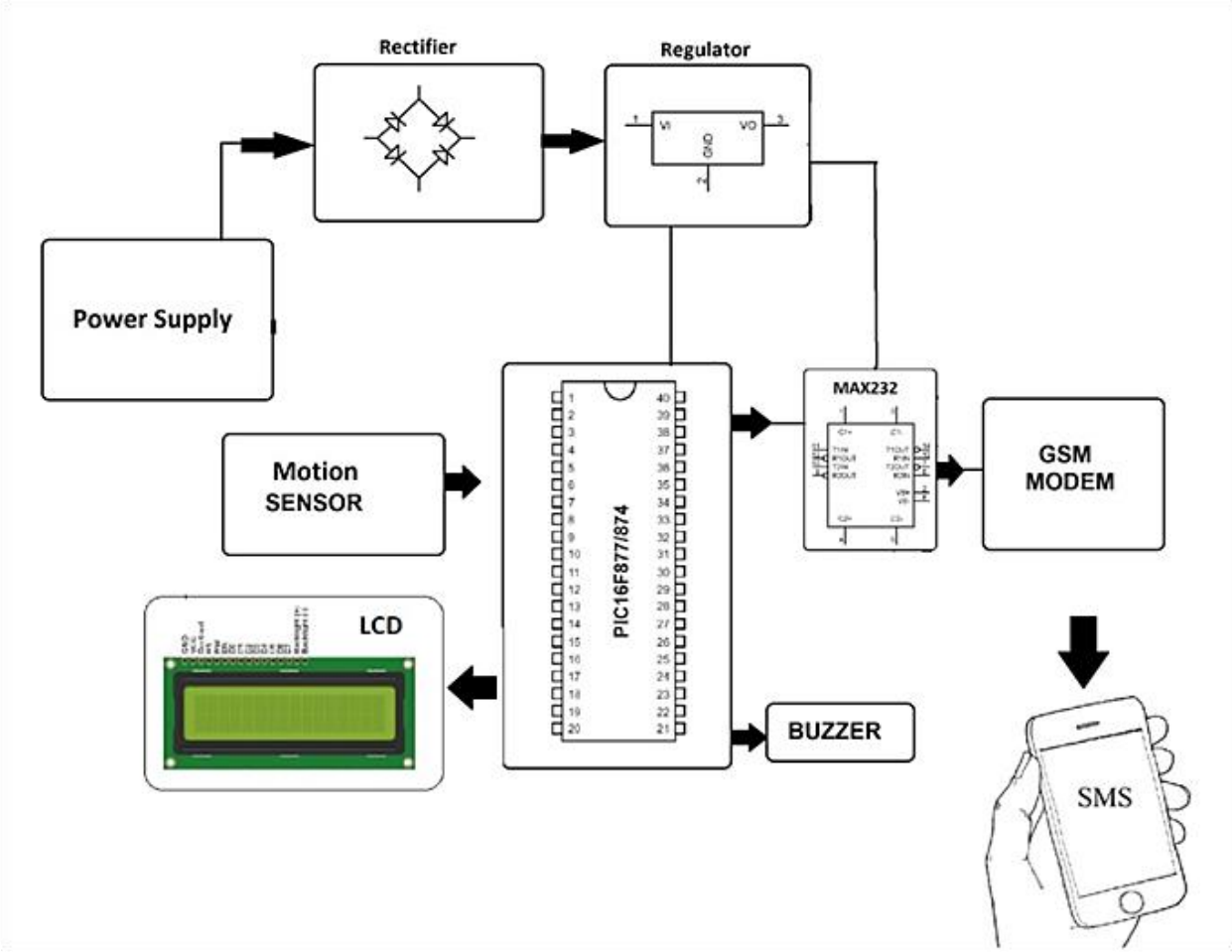
5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS



5.2 SOLUTION & TECHNICAL ARCHITECTURE

System that is built for monitoring the crop field with the help of sensor the IOT device is used to indicate The farmer by a message while someone enter into the Farm and we are used SD card module that helps to Store a specified sound to fear the animals The announcement of the threshold rate will be sent to the cell number or to the website. The result will be generated on a catalog if the mobile of the person to take the necessary action.



5.3 USER STORIES

PAPER TITLE	AUTHOR	OUTCOME
Smart crop protection system against wild animals using iot	Ms.Netra V.Deshmukh Dr.Ravindra M.Deshmukh Prof. Praveen Likhitkar	Crops are vulnerable to wild animals. Therefore, it is very important to monitor the nearby presence of animals. Then the actuation of various devices should follow to repel the hazardous animals
Implementation of IIoT based smart crop protection and irrigation system	Ipseeta Nanda Sahithi Chadalavada Medepalli Swathi Lizina Khatua	A centralizing method in the area of IIoT (Industrial Internet of Things) contrived for understanding agriculture which is preceding the arrangements low-power devices. This paper yields a monitoring procedure for farm safety against animal attacks and climate change conditions.
Smart crop protection system from wild animals and birds using IoT	Sumana P.B Sharanya.M Sanjana.R Harish.N.J	The system will detect intrusion around the field using camera that will capture the image of the intruder and sends notification to farm owner and forest officials using Message.
Crop Protrction System Using IoT	Abilash M Dr Balakrishna K Navyashree H R	The system keep notifying all the background activities to the former by sending SMS to the registered number (farmer) and it display the sensor reading on the LCD display embedded with the system

User Type	Functional requirement (Epic)	User Story number	User Story/Task	Acceptance criteria	Priority	Release
Customer (Mobil user)	Registration	USN-1	User can enter into the web application	I can access my account /dashboard	High	Sprint 1
		USN-2	User can register their credentials like email id and password	I can receive confirmation email & click confirm	High	Sprint 1
	Login	USN-3	User can log into the application by entering email & 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	User can view the level of sensor monitoring value	I can view the data given by the device	High	Sprint 2
Customer (Web user)	Usage	USN-1	User can view the web page and get the information	I can view the data given by the device	High	Sprint 3
Customer	Working	USN-1	User act according to the alert given by the device	I can get the data work according to it	High	Sprint 3
		USN-2	User turns ON Buzzer/Sound Alarm when the disturbance will occur on field.	I can get the data work according to it		Sprint 4
Customer care Executive	Action	USN-1	User solve the problem when some faces any usage issues	Ican solve the issues when some one fails to understand the procedures	High	Sprint 4
Administration	Administration	USN-1	User store every information	I can store the gained information	High	Sprint 4

6.PROJECT PLANING AND SCHEDULING

6.1 SPRINT PLANING AND ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1		US-1	Create the IBM Cloud services which are being used in this project.	6	High	Saranya, Bhavya, Poovarashan, Rengenaathan
Sprint-1		US-2	Configure the IBM Cloud services which are being used in completing this project.	4	Medium	Saranya, Bhavya, Poovarashan, Rengenaathan
Sprint-2		US-3	IBM Watson IoT platform acts as the mediator to connect the web application to IoT devices, so create the IBM Watson IoT platform.	5	Medium	Saranya, Bhavya, Poovarashan, Rengenaathan
Sprint-2		US-4	In order to connect the IoT device to the IBM cloud, create a device in the IBM Watson IoT platform and get the device credentials.	5	High	Saranya, Bhavya, Poovarashan, Rengenaathan
Sprint-3		US-1	Configure the connection security and create API keys that are used in the Node-RED service for accessing the IBM IoT Platform.	10	High	Saranya, Bhavya, Poovarashan, Rengenaathan
Sprint-3		US-2	Create a Node-RED service.	1	High	Saranya

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
						Bhavya, Poovarashan, Rengenaathan
Sprint-3		US-1	Develop a python script to publish random sensor data such as temperature, moisture, soil and humidity to the IBM IoT platform	7	High	Saranya, Bhavya, Poovarashan, Rengenaathan
Sprint-3		US-2	After developing python code, commands are received just print the statements which represent the control of the devices.	5	Medium	Saranya, Bhavya, Poovarashan, Rengenaathan
Sprint-4		US-3	Publish Data to The IBM Cloud	8	High	Saranya, Bhavya, Poovarashan, Rengenaathan
Sprint-4		US-1	Create Web UI in Node- Red	10	High	Saranya, Bhavya, Poovarashan, Rengenaathan
Sprint-4		US-2	Configure the Node-RED flow to receive data from the IBM IoT platform and also use Cloudant DB nodes to store the received sensor data in the cloudant DB	10	High	Saranya, Bhavya, Poovarashan, Rengenaathan

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

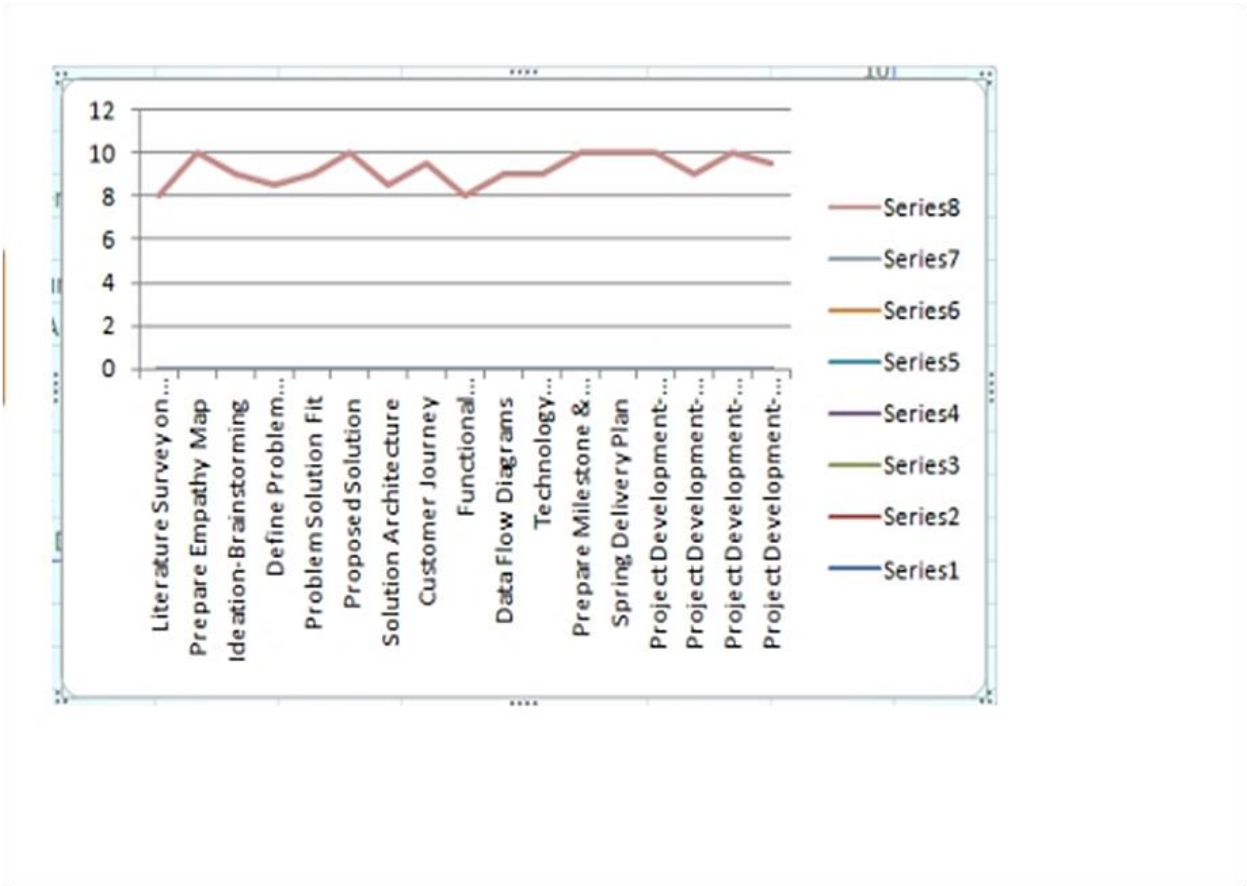
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	25 Oct2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Nov 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

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

7



7.1 CODING AND SOLUTION

7.1 FEATURE-1

The random sensor data's are generated and automation has been implemented through the python code instead of using hardware to implement IOT based crop protection system. And the python code need to upload the data's in IBM cloud are written in this python script.

Python Code:

```
import random
 import
 ibmiotf.application
 import ibmiotf.device from
```

```
time import sleep
 import sys

#IBM Watson Device Credentials.
organization = "gtlwge"
deviceType = NodeMCU"
deviceId = "12345"
authMethod = "token" authToken = "12345678"
 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()


#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","Not Detected",]
 camera_reading = random.choice(camera)      flame = ["Detected","Not Detected","Not Detected","Not Detected","Not Detected","Not Detected",]
  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)
  if
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,use other fertilizer" %PH_sensor } , qos=0)
        sleep(1)
         if
 success:
            print('Published alert2 : ' , "Fertilizer PH level(%s) is not safe,use other fertilizer"
%PH_sensor,"to IBM 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 take immediate action.

```
    if (flame_reading == "Detected"):
        print("sprinkler-2 is ON")          success = deviceCli.publishEvent("Alert4", "json", {
'alert4' : "Flame is detected crops are in danger,sprinklers turned ON" }, qos=0)
        sleep(1)
       if
```

```
success:
            print( 'Published alert4 : ' , "Flame is detected crops are in danger,sprinklers turned
ON","to IBM Watson")
            print("")


     else:
        print("sprinkler-2 is OFF")          print("")
```

#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,
Irrigation started" %moist_level }, qos=0)
          sleep(1)
   if
success:
              print('Published alert5 : ' , "Moisture level(%s) is low, Irrigation started"
%moist_level,"to IBM Watson" )
              print("")
  else:
        print("Motor-1 is OFF")
 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 is ON 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("")
  else:
        print("Motor-2 of OFF")
        print("")


    #command recived by farmer       deviceCli.commandCallback = myCommandCallback #
Disconnect the device and application from the cloud deviceCli.disconnect()
```

8. TESTING

8.1 TEST CASE

SPRINT-1

1. Registration-100%
2. Login-100%
3. Dashboard-100%

SPRINT-2

4. Program-80%

5. Store data-90%

SPRINT-3

6. Communication-90%

7. Node Red-90%

SPRINT-4

8. Node Red-90%

9. Mit inverter-90%

9. RESULTS

9.1 PERFORMANCE METRICS

The IOT device is used to indicate the farmer by a message while someone enter into the farm and we are used SD card module that helps to store a specified sound to fear the animals. This project is smart crop protection system for protect the farm from animals as well as unknown person.IOT in agriculture uses robots, drones, remote sensors, and computer imaging combined with continuously progressing machine learning and analytical tools for monitoring crops, surveying, and mapping the fields, and providing data to farmers for rational farm management plans to save both time and money.

The problem of crop protection by wild animals has become a major social problem in the current time. It requires urgent attention and an effective solution. In this project, we presented an integrative approach in the field of Internet of Things for smart Agriculture based on low power devices and open source systems. The main aim is to prevent the loss of crops and to protect the area from intruders and wild animals which pose a major threat to the agricultural areas. Also 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 crop yields thus leading to their economic wellbeing.

Many of the smart applications can be developed by the IOT and vastly utilized by users. The working of smart devices in farming allows farmers to apply amount of many resources at right time and right place in right time This type of farming is having less cost. This system operates many machines and equipments very smartly and collects the data based on these equipments from the field by configuring the problems when they are detected Farming with IOT helps in mitigating the shortage of food by demanding the existing land for stronger utilization at minimum cost. Smart farming is a notion that quickly snaps on the agricultural field. This offers automated farming techniques, useful data collection and high-rigor cro control. The main goal of this Smart Farming is to optimize the harvesting land per unit by using modern methods to achieve best in terms of quality, quantity and financial return.

10. ADVANTAGES

1) INTELLIGENT DATA COLLECTION

Sensors installed on IOT devices are able to collect a large volume of useful information for farmers. As we mentioned below, some examples are climatic conditions, soil quality and plantation progress. Such data can be used to monitor the status of the farm, as well as the performance of workers and the efficiency of the appliances.

2) WASTE REDUCTION

With greater production control, IOT in agriculture facilitates cost-efficient management. From smart devices, producers can more accurately identify any anomaly in the crop, for example. Consequently, it is easier to effectively prevent any infestation that will harm yields. In addition, one can also save in the process of irrigation and fertilization. After all, there are sensors installed in the agricultural machinery, which can generate a lot of information about the soil. Another advantage is the possibility of programming the sensors to notify about the ideal harvest time. In this way, waste is avoided in the crop.

3) SOIL CORRECTION

As with water control, the same devices can be used to measure pH levels and other soil nutrients. From this, they are able to identify the points that need correction fertilization etc. Use of drones in the agricultural environment provided numerous facilities and solutions. Because they are

integrated into the Internet and have sensors, GPS and other attributes, it democratized information collection and made decision making more effective. Thus, making an accurate diagnosis of crop health has become less laborious. As the producer no longer needs to travel miles for this, drones have generated a great saving of time and resources.

4) COST-EFFECTIVE OPERATION

Due to the reduced downtime periods, ensured by automatically scheduled and controlled maintenance, supply of raw materials, and other manufacturing requirements, the equipment may have a higher production rate resulting in bigger profits. Again, IOT devices greatly facilitate management within individual departments and across the whole enterprise structure.

DISADVANTAGES

1. **SECURITY**

As the IOT systems are interconnected and communicate over networks. The system offers little control despite any security measures, and it can be lead the various kinds of network attacks.

2. **COMPLEXITY**

The designing, developing, and maintaining and enabling the large technology to IOT system is quite complicated.

3. **PRIVACY**

Even without the active participation on the user, the IOT system provides substantial personal data in maximum detail.

11. CONCLUSION

Smart Farming IOT Based Agriculture Stick for Live Monitoring of Temperature and Soil Moisture has been proposed using Node MCU Chip various other Hardware Devices. The stick has high efficiency and accuracy in fetching the live data of temperature, humidity, and soil moisture. The IOT-based Agriculture stick being developed through this paper will help farmers in increasing the agriculture yield and take efficient care of food production as the stick will always provide a helping hand to farmers for getting accurate live feed of environmental temperature and

soil moisture with accurate results. With the help of these systems, various problems faced by farmers in daily life are being solved to a greater extent. Therefore, this system avoids excessive irrigation, under irrigation, soil erosion, and reduces water wastage. The main advantage is that the action of the system can be changed depending on the situation (plants, climate, soil, etc.). Through this program, agriculture, agricultural fields, parks, gardens, golf courses can be measured. Therefore, this program is cheaper and more efficient compared to other types of automation systems. For larger applications, higher sensitivity can be performed in large areas of agricultural land. A soil moisture level monitoring system was developed and the project provided an opportunity to study existing systems, as well as their features and constraints. The proposed system can be used to turn off / off the water spray according to soil moisture levels thus making the irrigation process one of the most time-consuming agricultural activities. Agriculture is one of the biggest uses of water.

12. FUTURE SCOPE

Through collecting data from sensors using IOT devices, you will learn about the real-time state of your crops. The future of IOT in agriculture allows predictive analytics to help you make better

harvesting decisions. Pattern forecasting can be used by farmers to predict weather patterns and crop harvesting.

13. APPENDIX

SOURCE CODE

HTML INDEX CODE FOR REGISTRATION LOGIN PAGE:

```
<!DOCTYPE html>

<html lang="en">

<head>

<meta charset="UTF-8">

<meta http-equiv="X-UA-Compatible" content="IE=edge">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<title>smart.com</title>

<style>

      @import
url('https://fonts.googleapis.com/css2?family=Poppins:wght@400;500;600&display=swap');

*{

  margin: 0;
```

```
  padding: 0;
  box-sizing: border-box;
  font-family: "Poppins", sans-serif;
}
body{
  width: 100%;
  height: 100vh;
  display: flex;
  align-items: center;
  justify-content: center;
  background: #5372F0;
}
::selection{
color: #fff;
  background: #5372F0;
}
.wrapper{
  width: 380px;
  padding: 40px 30px 50px 30px;
  background: #fff;
```

```
  border-radius: 5px;
  text-align: center;
  box-shadow: 10px 10px 15px rgba(0,0,0,0.1);
}
.wrapper header{
  font-size: 35px;
  font-weight: 600;
}
.wrapper form{
  margin: 40px 0;
}
form .field{
  width: 100%;
  margin-bottom: 20px;
}
form .field.shake{
  animation: shake 0.3s ease-in-out;
}
@keyframes shake {
  0%, 100%{
```

```
    margin-left: 0px;
  }
  20%, 80%{
    margin-left: -12px;
  }
  40%, 60%{
    margin-left: 12px;
  }
}
form .field .input-area{
  height: 50px;
  width: 100%;
  position: relative;
}
form input{
  width: 100%;
  height: 100%;
  outline: none;
  padding: 0 45px;
  font-size: 18px;
```

```
  background: none;
  caret-color: #5372F0;
  border-radius: 5px;
  border: 1px solid #bfbfbf;
  border-bottom-width: 2px;
  transition: all 0.2s ease;
}
form .fieldinput:focus,
form .field.valid input{
  border-color: #5372F0;
}
form .field.shake input,
form .field.error input{
  border-color: #dc3545;
}
.field .input-area i{
  position: absolute;
  top: 50%;
  font-size: 18px;
  pointer-events: none;
```

```
  transform: translateY(-50%);
}
.input-area .icon{
  left: 15px;
color: #bfbfbf;
  transition: color 0.2s ease;
}
.input-area .error-icon{
  right: 15px;
color: #dc3545;
}
form input:focus ~ .icon,
form .field.valid .icon{
color: #5372F0;
}
form .field.shakeinput:focus ~ .icon,
form .field.errorinput:focus ~ .icon{
color: #bfbfbf;
}
form input::placeholder{
```

```
color: #bfbfbf;
  font-size: 17px;
}
form .field .error-txt{
color: #dc3545;
  text-align: left;
  margin-top: 5px;
}
form .field .error{
  display: none;
}
form .field.shake .error,
form .field.error .error{
  display: block;
}
form .pass-txt{
  text-align: left;
  margin-top: -10px;
}
.wrapper a{
```

```
color: #5372F0;
  text-decoration: none;
}
.wrapper a:hover{
  text-decoration: underline;
}
form input[type="submit"]{
  height: 50px;
  margin-top: 30px;
color: #fff;
  padding: 0;
  border: none;
  background: #5372F0;
  cursor: pointer;
  border-bottom: 2px solid rgba(0,0,0,0.1);
  transition: all 0.3s ease;
}
form input[type="submit"]:hover{
  background: #2c52ed;
}
```

```
</style>

</head>

<body>

<meta charset="UTF-8">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<title>Login Form validation in HTML & CSS | CodingNepal</title>

<link rel="stylesheet" href="style.css">

<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.3/css/all.min.css"/>

</head>

<body>

<div class="wrapper">

<header>Login Form</header>

<form action="#">

<div class="field email">

<div class="input-area">

<input type="text" placeholder="Email Address">

<i class="icon fas fa-envelope"></i>

<i class="error error-icon fas fa-exclamation-circle"></i>

</div>
```

```
<div class="error error-txt">Email can't be blank</div>
</div>
<div class="field password">
<div class="input-area">
<input type="password" placeholder="Password">
<i class="icon fas fa-lock"></i>
<i class="error error-icon fas fa-exclamation-circle"></i>
</div>
<div class="error error-txt">Password can't be blank</div>
</div>
<div class="pass-txt"><a href="#">Forgot password?</a></div>
<input type="submit" value="Login">
</form>
<div class="sign-txt">Not yet member? <a href="#">Signup now</a></div>
</div>
<script>
const form = document.querySelector("form");
eField = form.querySelector(".email"),
eInput = eField.querySelector("input"),
pField = form.querySelector(".password"),
```

```
pInput = pField.querySelector("input");


form.onsubmit = (e)=>{
e.preventDefault(); //preventing from form submitting
  //if email and password is blank then add shake class in it else call specified function
  (eInput.value == "") ?eField.classList.add("shake", "error") : checkEmail();
  (pInput.value == "") ?pField.classList.add("shake", "error") : checkPass();


setTimeout(()=>{ //remove shake class after 500ms
eField.classList.remove("shake");
pField.classList.remove("shake");
  }, 500);


eInput.onkeyup = ()=>{checkEmail();} //calling checkEmail function on email input keyup
pInput.onkeyup = ()=>{checkPass();} //calling checkPassword function on pass input keyup


  function checkEmail(){ //checkEmail function
    let pattern = /^[^ ]+@[^ ]+\.[a-z]{2,3}$/; //pattern for validate email
    if(!eInput.value.match(pattern)){ //if pattern not matched then add error and remove valid class
eField.classList.add("error");
```

```
eField.classList.remove("valid");
      let errorTxt = eField.querySelector(".error-txt");
      //if email value is not empty then show please enter valid email else show Email can't be blank
      (eInput.value != "") ? errorTxt.innerText = "Enter a valid email address" : errorTxt.innerText = "Email can't be blank";
}else{ //if pattern matched then remove error and add valid class
eField.classList.remove("error");
eField.classList.add("valid");
    }
  }

  function checkPass(){ //checkPass function
if(pInput.value == ""){ //if pass is empty then add error and remove valid class
pField.classList.add("error");
pField.classList.remove("valid");
}else{ //if pass is empty then remove error and add valid class
pField.classList.remove("error");
pField.classList.add("valid");
    }
  }
```

```
  //if eField and pField doesn't contains error class that mean user filled details properly
  if(!eField.classList.contains("error") && !pField.classList.contains("error")){
window.location.href = form.getAttribute("action"); //redirecting user to the specified url which is inside action attribute of form tag
  }
}
</script>
</body>
</html>
```

DASHBOARD CODE(JAVASCRIPT CODE):

```
<!DOCTYPE html>
<!-- Coding by CodingLab | www.codinglabweb.com-->
<html lang="en" dir="ltr">
<head>
<meta charset="UTF-8">
<!--<title> Website with Customize Color Theme | CodingLab</title>-->
<link rel="stylesheet" href="style.css">
<!--Fontawesome CDN Link -->
```

```
<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/fontawesome/5.15.4/css/all.min.css" />

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<style>

@import

url('https://fonts.googleapis.com/css2?family=Poppins:wght@200;300;400;500;600

;700&display=swap');

*{

margin: 0;

padding: 0;

box-sizing: border-box;

font-family: 'Poppins',sans-serif;

transition: all 0.3s ease;

}

:root{

--white: #fff;

--black: #24292d;

--nav-main: #4070f4;

--switchers-main: #0b3cc1;

--light-bg: #F0F8FF;
```

```
}

nav{

position: fixed;

height: 70px;

width: 100%;

background: var(--nav-main);

box-shadow: 0 5px 10px rgba(0,0,0,0.1);

}

nav .navbar{

display: flex;

align-items: center;

height: 100%;

max-width: 1300px;

margin: auto;

padding: 0 30px;

justify-content: space-between;

}

nav .navbar a{

font-size: 30px;

font-weight: 500;
```

```
color: var(--white);
text-decoration: none;
}
.navbar .nav-links{
display: flex;
}
.navbar .nav-links li{
margin: 0 8px;
list-style: none;
display: flex;
}
.navbar .nav-links a{
font-size: 18px;
font-weight: 400;
opacity: 1;
}
.navbar .nav-links a:hover{
opacity: 1;
}
.navbar .appearance{
```

```
display: flex;
align-items: center;
}
.appearance .light-dark,
.appearance .icons{
height: 50px;
width: 50px;
border-radius: 6px;
line-height: 50px;
text-align: center;
color: var(--white);
font-size: 20px;
background: var(--switchers-main);
cursor: pointer;
}
.appearance .light-dark i,
.appearance .icons i{
opacity: 1;
}
.appearance .light-dark:hoveri,
```

```
.appearance .icons:hoveri{
opacity: 1;
}
.appearance .light-dark:hover{
box-shadow: 0 5px 10px rgba(0,0,0,0.1)
}
.appearance .light-dark i{
height: 100%;
width: 100%;
}
.appearance .color-icon{
position: relative;
}
.appearance .icons{
width: 70px;
height: 50px;
margin-left: 14px;
}
.appearance .color-box{
position: absolute;
```

```
bottom: -133px;

right: 0;

min-height: 100px;

background: var(--white);

padding: 16px 20px 20px20px;

border-radius: 6px;

box-shadow: 0 5px 10px rgba(0,0,0,0.2);

opacity: 0;

pointer-events: none;

}

.color-box::before{

content: '';

position: absolute;

top: -10px;

right: 20px;

height: 30px;

width: 30px;

border-radius: 50%;

background: var(--white);

transform: rotate(45deg);
```

```
}

.color-icon.open .color-box{

opacity: 1;

pointer-events: auto;

}

.color-icon.open .arrow{

transform: rotate(-180deg);

}

.appearance .color-box h3{

font-size: 16px;

font-weight: 600;

display: block;

color: var(--nav-main);

text-align: left;

white-space: nowrap;

margin-bottom: 10px;

}

.appearance .color-box .color-switchers{

display: flex;

}
```

```
.color-box .color-switchers .btn{
display: inline-block;
height: 40px;
width: 40px;
border: none;
outline: none;
border-radius: 50%;
margin: 0 5px;
cursor: pointer;
background: #4070F4;
}
.color-switchers .btn.blue.active{
box-shadow: 0 0 0 2px #fff,
0 0 0 4px #4070F4;
}
.color-switchers .btn.orange{
background: #F79F1F;
}
.color-switchers .btn.orange.active{
box-shadow: 0 0 0 2px #fff,
```

```
0 0 0 4px #F79F1F;
}
.color-switchers .btn.purple{
background: #8e44ad;
}
.color-switchers .btn.purple.active{
box-shadow: 0 0 0 2px #fff,
0 0 0 4px #8e44Ad;
}
.color-switchers .btn.green{
background: #3A9943;
}
.color-switchers .btn.green.active{
box-shadow: 0 0 0 2px #fff,
0 0 0 4px #3A9943;
}
.home-content{
height: 100vh;
width: 100%;
background: var(--light-bg);
```

```
display: flex;
flex-direction: column;
justify-content: center;
padding: 0 60px;
}
.home-content h2{
color: var(--black);
font-size: 50px;
}
.home-content h3{
color: var(--black);
font-size: 42px;
margin-top: -8px;
}
.home-content h3 span{
color: var(--nav-main);
}
.home-content h3 span.darkMode{
color: var(--black);
}
```

```
.home-content p{
color: var(--black);
font-size: 16px;
width: 45%;
text-align: justify;
margin: 4px 0 30px 0;
}
.home-content a{
color: #fff;
font-size: 20px;
padding: 12px 24px;
border-radius: 6px;
text-decoration: none;
background: var(--nav-main);
}
.home-content a i{
transform: rotate(45deg);
font-size: 16px;
}
.home-content a:hover{
```

```
background: var(--switchers-main);
}
@media (max-width: 1050px) {
.home-content p{
width: 70%;
}
}
.price-section{
padding: 40px 0;
}
.price-box{
background: radial-gradient(ellipse at center, #5fb3fc 0%, #0089ff 100%);
border-radius: 0 0 15px 0;
padding: 45px 30px;
position: relative;
z-index: 1;
margin-right: 30px;
margin-bottom: 60px;
}
.price-box .ribbon-wrap {
```

```
position: absolute;

width: 100%;

height: 100%;

left: 0;

top: 0;

z-index: -1;

overflow: hidden;

}

.price-box .ribbon {

background: #ffd08d;

background: radial-gradient(ellipse at center, #ffd08d 0%, #fdb143 100%);

position: absolute;

height: 50px;

display: inline-flex;

justify-content: center;

align-items: center;

width: 200px;

top: 18px;

right: -48px;

transform: rotate(45deg);
```

```
text-transform: uppercase;

font-size: 13px;

font-weight: 600;

}

.price-box:after {

position: absolute;

z-index: -2;

content: "";

background-color: rgba(0, 137, 255, 0.12);

width: 100%;

height: 100%;

border-radius: 0 0 15px 0;

top: 30px;

left: 30px;

}

.price-box .price-head {

margin-bottom: 24px;

position: relative;

padding-bottom: 20px;

}
```

```
.price-box .price-head:before {
width: 5px;
left: -30px;
top: 0;
height: calc(100% - 20px);
background-color: #FEB747;
position: absolute;
content: "";
}
.price-box .price-head:after {
width: 100%;
left: 0;
bottom: 0;
height: 1px;
position: absolute;
background: #fff;
opacity: 0.07;
content: "";
}
.price-box .price-head p {
```

```
font-size: 24px;

margin-bottom: 15px;

line-height: 1;

font-weight: 600;

}

.price-box .price {

line-height: 1;

padding-bottom: 7px;

font-size: 14px;

}

.price-box .price .currency {

vertical-align: top;

font-size: 22px;

font-weight: 700;

}

.price-box .price .value {

font-size: 42px;

font-weight: 700;

}

.price-box .price .duration{
```

```
font-weight: 600;
}
.price-box .price-body {
margin-bottom: 30px;
position: relative;
padding-bottom: 8px;
}
.price-box .price-body:after {
width: 100%;
left: 0;
bottom: 0;
height: 1px;
position: absolute;
opacity: 0.07;
content: "";
background: #fff;
}
.price-box .price-body-top-content {
margin-bottom: 16px;
}
```

```
.price-box .price-body .save, .price-box .price-body .billed {
margin-bottom: 2px;
}
.price-box .price-body .billed {
margin-bottom: 2px;
}
.price-box .price-body ul {
padding: 0;
margin: 0;
list-style-type: none;
margin-bottom: 20px;
}
.price-box .price-body ul li {
margin-bottom: 4px;
opacity: 0.75;
}
.btn {
padding: 20px 34px;
color: #0089FF;
font-size: 12px;
```

```
text-transform: uppercase;

overflow: hidden;

font-weight: 600;

border-radius: 50px;

line-height: 1;

border: none;

display: inline-flex;

align-items: center;

position: relative;

background-color: #ffffff;

z-index: 1;

}

.btnsvg {

margin-left: 10px;

fill: #0089FF;

}

.btn:after {

position: absolute;

content: "";

z-index: -1;
```

```
left: 0;

top: 0;

width: 0;

height: 100%;

background: #ffd08d;

transition: 0.3s ease-in-out;

background: radial-gradient(ellipse at center, #ffd08d 0%, #fdb143 100%);

}

.btn:hover{

color: #fff;

}

.btn:hoversvg{

fill: #fff;

}

.btn:hover:after {

width: 100%;

}

</style>

</head>

<body>
```

```
<nav>
<div class="navbar">
<div class="logo"><a href="#">Childrensafety</a></div>
<ul class="nav-links">
<li><a href="#">Home</a></li>
<li><a href="#">About</a></li>
<li><a href="#">Locations</a></li>
<li><a href="#">Services</a></li>
<li><a href="#">Contact</a></li>
</ul>
<div class="appearance">
<div class="light-dark">
<i class="btnfas fa-moon" data-color="#e4e6eb #e4e6eb #24292D
#24292D #24292D #242526"></i>
</div>
<div class="color-icon">
<div class="icons">
<i class="fas fa-palette"></i>
<i class="fas fa-sort-down arrow"></i>
</div>
```

```
<div class="color-box">

<h3>Color Switcher</h3>

<div class="color-switchers">

<button class="btn blue active" data-color="#fff #24292d #4070f4

#0b3cc1 #F0F8FF"></button>

<button class="btn orange" data-color="#fff #242526 #F79F1F

#DD8808 #fef5e6"></button>

<button class="btn purple" data-color="#fff #242526 #8e44ad

#783993 #eadaf1"></button>

<button class="btn green" data-color="#fff #242526 #3A9943

#2A6F31 #DAF1DC"></button>

</div>

</div>

</div>

</div>

</nav>

<section class="home-content">

<div class="texts">

<h2 class="text">Children Safety Website </h2>
```

```
<h3 class="text">Welcome <span>This Website....</span></h3>
<p>With a GPS device, you always know where they are at any point in
time. In case of mishaps like an accident or missing elderly parents or kids,
you can easily find their location. There are many features in the device such
as fencing, alert, etc. that allow you better and faster tracking.</p>
<div class="button">
<a href="#">Track Now
<i class="fas fa-location-arrow"></i></a>
</div>
</section>
<br><br>
<section class="price-section">
<div class="container">
<h1 style="color: rgb(199, 0, 0);">Tracking Device</h1>
<h2 style="color: rgb(199, 0, 0);">The Next Generation Child Safety
GPS Tracker</h2>
<div class="row">
<div class="col-md-4 col-sm-6 col-xs-12">
<div class="price-box">
<div class="price-head">
```

```
<p>Real-Time Tracking</p>

<div class="price">

<span class="currency">Live</span>

<span class="value">Map</span>

<span class="duration">Tracker</span>

</div>

</div>

<div class="price-body">

<div class="price-body-top-content">

<p class="billed">Stay connected to your kids when

you are not with them. </p>

<p class="save">Gain peace of mind by following

your kids exact location on a live map</p>

</div>

<ul>

<li>Real-time updates wherever they are, from

anywhere you are.</li>

<li>The device fetches accurate location using GPS

(outdoors) and cellular network (indoors, no-GPS coverage areas).

</li>
```

```
</ul>

</div>

<a href="price.html" class="btn">Start Now

<svg width="13.539" height="11.283" viewBox="0 0

13.539 11.283" class="svg replaced-svg">

<path id="btn-svg"

d="M8.564,17.077H19.818l-4.309-

4.1a.564.564,0,0,1,.778-.817l4.921,4.688a1.128,1.128,0,0,1-
.01,1.605l4.912,4.678a.564.564,0,1,1-.778-.817l4.327-4.1H8.564a.564.564,0,0,1,0-
1.128Z"

transform="translate(-8 -12)"></path>

</svg>

</a>

</div>

</div>

<div class="col-md-4 col-sm-6 col-xs-12">

<div class="price-box">

<div class="ribbon-wrap">

<h4 class="ribbon">Safety</h4>

</div>

<div class="price-head">
```

```
<p>Safe-Zone Alert</p>

<div class="price">

<span class="currency">Safe</span>

<span class="value">Zone</span>

<span class="duration">Notification</span>

</div>

</div>

<div class="price-body">

<div class="price-body-top-content">

<p class="billed">Get notifications when your

child come or go from any place you choose on the Google map.</p>

<p class="save">Create custom safe-zones </p>

</div>

<ul>

<li>Make virtual safe boundaries on Google map.

Create any number of safe-zones for familiar areas such as </li>

<li>home, school or park.</li>

</ul>

</div>

<a href="price.html" class="btn">Start Now
```

```
<svg width="13.539" height="11.283" viewBox="0 0

13.539 11.283" class="svg replaced-svg">

<path id="btn-svg"

d="M8.564,17.077H19.818l-4.309-

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.01,1.605l4.912,4.678a.564.564,0,1,1-.778-.817l4.327-4.1H8.564a.564.564,0,0,1,0-
1.128Z"

transform="translate(-8 -12)"></path>

</svg>

</a>

</div>

</div>

<div class="col-md-4 col-sm-6 col-xs-12 col-md-offset-0 col-smoffset-3">

<div class="price-box">

<div class="price-head">

<p>Panic Button</p>

<div class="price">

<span class="currency">Show</span>

<span class="value">Notification</span>

<span class="duration">Exact Location</span>

</div>
```

```
</div>

<div class="price-body">

<div class="price-body-top-content">

<p class="billed">Your child can get your

attention with a simple button click. </p>

<p class="save">Current Location</p>

</div>

<ul>

<li> You will get child’s exact location, no

matter how far and navigate to their </li>

<li>location on Google maps.</li>

</ul>

</div>

<a href="price.html" class="btn">Start Now

<svg width="13.539" height="11.283" viewBox="0 0

13.539 11.283" class="svg replaced-svg">

<path id="btn-svg"

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4.1a.564.564,0,0,1,.778-.817l4.921,4.688a1.128,1.128,0,0,1-
.01,1.605l4.912,4.678a.564.564,0,1,1-.778-.817l4.327-4.1H8.564a.564.564,0,0,1,0-
1.128Z"
```

```
transform="translate(-8 -12)"></path>
</svg>
</a>
</div>
</div>
</div>
</div>
</section>
<script>
// Js code to make color box enable or disable
let colorIcons = document.querySelector(".color-icon"),
icons = document.querySelector(".color-icon .icons");
icons.addEventListener("click" , ()=>{
colorIcons.classList.toggle("open");
})
// getting all .btn elements
let buttons = document.querySelectorAll(".btn");
for (var button of buttons) {
button.addEventListener("click", (e)=>{ //adding click event to each
button
```

```
let target = e.target;

let open = document.querySelector(".open");

if(open) open.classList.remove("open");

document.querySelector(".active").classList.remove("active");

target.classList.add("active");

// js code to switch colors (also day night mode)

let root = document.querySelector(":root");

let dataColor = target.getAttribute("data-color"); //getting data-color

values of clicked button

let color = dataColor.split(" "); //splitting each color from space and

make them array

//passing particular value to a particular root variable

root.style.setProperty("--white", color[0]);

root.style.setProperty("--black", color[1]);

root.style.setProperty("--nav-main", color[2]);

root.style.setProperty("--switchers-main", color[3]);

root.style.setProperty("--light-bg", color[4]);

let iconName = target.className.split(" ")[2]; //getting the class name

of icon

let coloText = document.querySelector(".home-content span");
```

```
if(target.classList.contains("fa-moon")){ //if icon name is moon
target.classList.replace(iconName, "fa-sun") //replace it with the sun
colorIcons.style.display = "none";
coloText.classList.add("darkMode");
}else if (target.classList.contains("fa-sun")) { //if icon name is sun
target.classList.replace("fa-sun", "fa-moon"); //replace it with the
sun
colorIcons.style.display = "block";
coloText.classList.remove("darkMode");
document.querySelector(".btn.blue").click();
}
});
}
</script>
</body>
</html>
```

GITHUBCODE- https://github.com/IBM-EPBL/IBM-Project-13340-1659516865