RMK ENGINEERING COLLEGE

(An Autonomous Institution)

R.S.M. Nagar, Kavaraipettai-601 206, Gummidipoondi Taluk, Thiruvallur District.

PROJECT

IOT Based Smart Crop Protection...

Team ID

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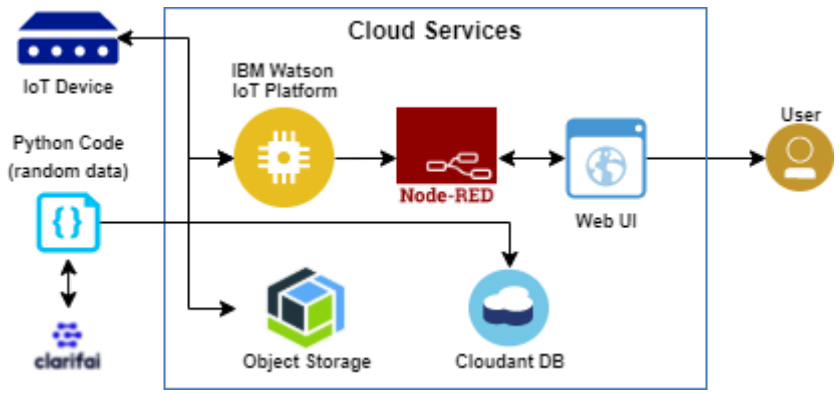
CONTENTS

1 INTRODUCTION

1 PROJECT OVERVIEW

An intelligent crop protection system helps the farmers in protecting the crop from the animals and birds which destroy the crop. This system also helps farmers to monitor the soil moisture levels in the field and also the temperature and humidity values nar the field. The motors and sprinklers in the field can be controlled using the mobile application.

Technical Architecture:



1.2 PURPOSE

It improves the entire farming system by monitoring the field in real time.

With the help of sensors and interconnectivity the internet of things has not only saved time of farmers

but also reduced extravagant use of resources such aswater and electricity.

2 LITERATURE SURVEY

2. IOT BASED SMART CROP PROTECTION SYSTEM FOR AGRICULTURE

ABSTRACT

The Smart protection system defines that this project help to farmer for the protection of a farm. We have designed this project for the only secure from animals but we this project have the provision to secure from the human begins also. This can achieve by the help of IOT device that we are discuss in this paper. 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.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 panel, solar charges converter. This whole project is work on 12v dc supply from battery.
We used solar panel to charge the battery.

Literature Survey:-

An IOT Based Crop-field monitoring an irrigation automation system describes how to monitor a crop field. A system is developed by using sensors and according to the decision from a server based on sensed data, the irrigation system is automated. Through wireless transmission the sensed data is forwarded to web server database. If theirrigation is automated then the moisture and temperature fields are decreased below the potential range. The user canmonitor and control the system remotely with the help of application which provides a web interface to user .

By smart Agriculture monitoring system and one of the oldest ways in agriculture is the manual method of checking the parameters. In this method farmers by themselves verify all the parameter and calculate the reading .The system focuses on developing devices and tool to manage, display and alert the users using the advantages of a wireless sensor network system. It aims at making agriculture smart using automation and IoT technologies .

The cloud computing devices are used at the end of the system that can create a whole computing system from sensors to tools that observe data from agriculture field. It proposes a novel methodology for smart farming by including a smart sensing system and smart irrigator system through wireless communication technology . This system is cheap at cost for installation. Here one can access and also

control the agriculture system in laptop, cell phone or acomputer.

LIMITATIONS:

- There could be a wrong analysis of weather conditions.
- Devices are to be altered according to the farmers, it will involve equipment which will be expensive.
- If there are faulty data processing equipment or sensors, then it will lead to a situation where the decisions are taken wrong .

2.2 Reference

Lil'eral'ure survey on l'he selecl'ed projecl' & Informal'ion Gal'hering

Collecl'ed l'he relevanl' informal'ion on projecl' use-case, referred l'he exisl'ing
solul'ions, l'echnical papers, research publical'ions el'c.

Paper 1 - **A Survey on Smart Agricultural System using IoT**

Publisher - IJERT

Reference -
https://www.ijert.org/a-survey-on-smart-agricultural-system-using-iot

Paper 2 - **A Literature Survey on Smart Agriculture Monitoring and Control System Using IOT**

Publisher - IJRASET

Reference -
hl'l'ps://www.ijrasel'.com/research-paper/smarl'-agricull'ure-monil'oring-and-conl'rol-sysl'em-using-i

2. Problem Sl'al'emenl' Definil'ion:

With the help of sensors it is possible to monitor soil quality, humidity, temperature, automate the irrigation process and others.

In this way farmers are able to monitor crop conditions remotely and better manage natural resources.

3. IDEATION & PROPOSED SOLUTION

3. Empathy Map

IOT Based Smart Crop Protection System for Agriculture

3 IDEATION

Idea 1:

Crops in the farms are many times devasted 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 farm to sentinel the crops .So to surmount is issues automated
perspicacioys crop aegis system in proposed utilising internet of things(IOT).The sysytem consist of
esp8266(nodeMCU),soil moisture sensor dihydrogen monoxide sensor,GPRS and GSM module,servo motor,dihydrogen monoxide pump,etc.To obtain the
required output.As soon as any Kineticism is detected the system will engender an alarm to be taken and the lights will glow up implemented at every corner of the farm.This will not harm any animal and the crops will stay forfended.

Idea 2:

The samrt protection system define that this project help to farmer for the protection of a

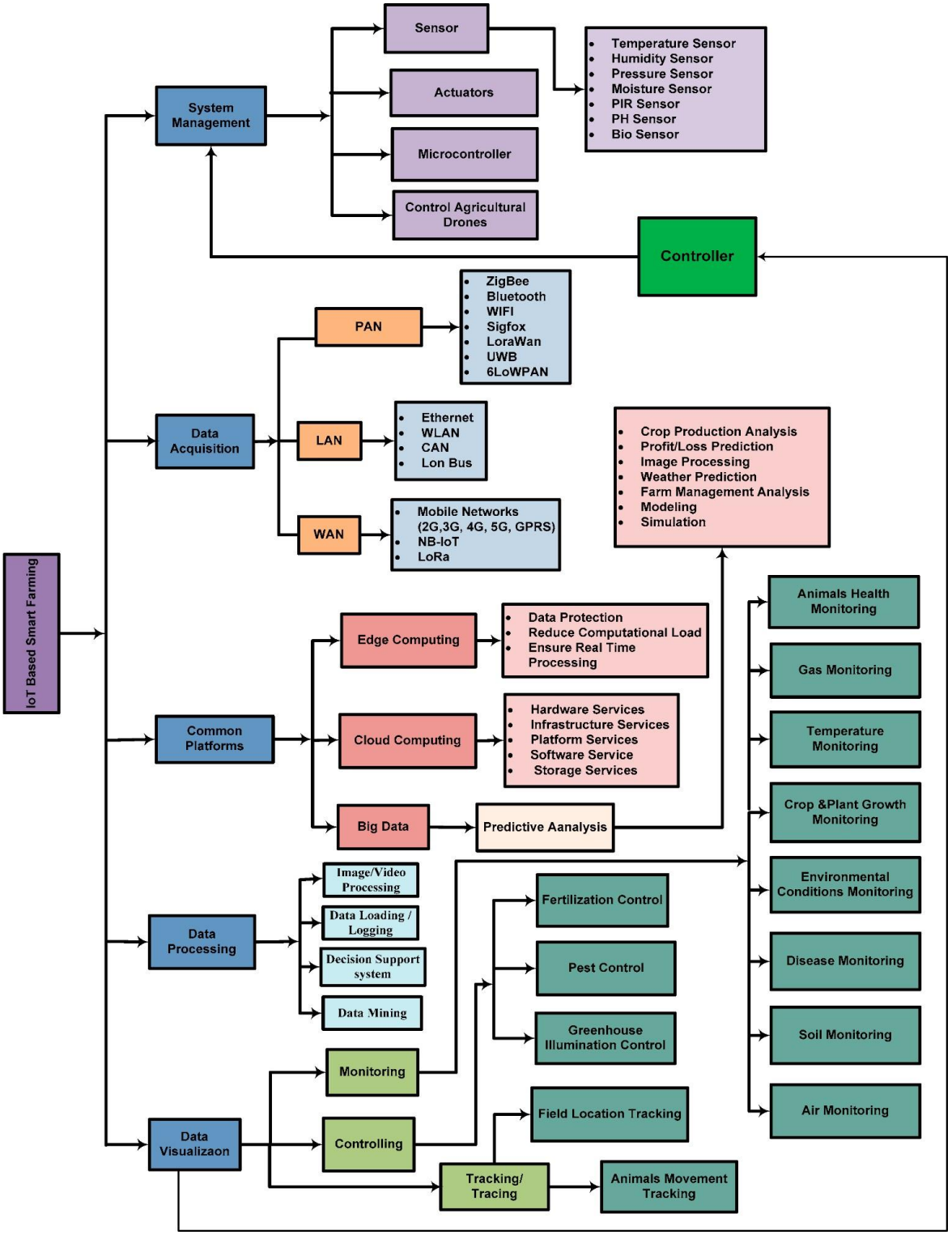
farm.We have designed this project for the only secure from animals but this project have the provisions to secure from the human beings also.This can be achieved by the help of the IOT device.The SCPS work on the battery so that this project can be easily portable and also we are added solar pannels 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 tofear the animals.

Idea 3:

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 project yields a monitoring procedure for farm safety against animal attacks and climate change conditions. IIoT advances are frequently used in smart farming to emphasize the standard of agriculture. It contains types of sensors,

controllers. On behalf of WSN, the ARM Cortex-A board which consumes 3W is the foremost essence of the procedure . Different sensors like DHT 11 Humidity & Temperature Sensor, PIR Sensor, LDR sensor, HC-SR04 Ultrasonic Sensor, and camera are mounted on the ARM Cortex-A board. The PIR goes high on noticing the movement within the scope, the camera starts to record, and the data will be
reserved onboard and in the IoT cloud, instantaneously information will be generated
automatically towards the recorded quantity using a SIM900A unit to notify about the interference with the information of the weather conditions attained by DHt11. If a variance happens, 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.

BRAINSTORMING:



IDEATION:

Project Design Phase-I

Proposed Solution Document

Date	04 OCTOBER 2022
Team ID	PNT2022TMID15746
Project Name	IOT BASED CROP PROTECTION SYSTEM FOR AGRICULTURE
Maximum Marks	2 Marks

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	• Crops are not irrigated properly due to insufficient labour forces. • Improper maintenance of crops against various environmental factors such as temperature climate, topography and soil quality which results in crop destruction. • Lack of knowledge among farmers in usage of fertilizers and hence crops are affected due to high ammonia, urea, potassium and high PH level fertilizers. • Requires protecting crops from Wild animals attacks, birds and pests.
2.	Idea / Solution description	• Moisture sensor is interfaced with Arduino Microcontroller to measure the moisture level in soil and relay is used to turn ON and OFF the motor pump for managing the excess water level. It will be updated to authorities through IOT. • Temperature sensor connected to microcontroller is used to monitor the temperature in the field. The optimum temperature required for crop cultivation is maintained using sprinklers. • IOT based fertilizing methods are followed, to minimize the negative effects on growth of crops while using fertilizers. • Image processing techniques with IOT is followed for crop protection against animal attacks.
3.	Novelty / Uniqueness	• Automatic crop maintenance and protection using embedded and IOT technology.
4.	Social Impact / Customer Satisfaction	• This proposed system provides many facilities which helps the farmers to maintain the crop field without much loss.
5.	Business Model (Revenue Model)	• This prototype can be developed as product with minimum cost with high performance .
6.	Scalability of the Solution	• This can be developed to a scalable product by using sensors and transmitting the data through Wireless Sensor Network and Analysing the data in cloud and operation is performed using robots

Project Title: IOT BASED CROP PROTECTION SYSTEMFOR AGRICULTURE

3. Problem Solution Fit

Team ID: PNT2022TMID15746

Define CS, fit into CL

1. CUSTOMER SEGMENT(S) — CS

- Farmers who trying to protect Crops from various problems

6. CUSTOMER LIMITATIONS EG. BUDGET, DEVICES — CL

- Limited supervision.
- Limited financial Constrains.
- Lack of man power.

5. AVAILABLE SOLUTIONS PLUSES & MINUSES — AS

- Automation in irrigation.
- CCTV Camera to monitor and supervise the crops.
- Alarm system to give alert while animals attacks the crops.

Explore AS, differentiate

Focus on PR, tap into BE, understand RC

2. PROBLEMS / PAINS + ITS FREQUENCY — PR

- Crops are not irrigated properly.
- Improper maintenance of crops.
- Lack of knowledge among farmers in usage of fertilizers and hence crops are affected.
- Requires protecting Crops from Wild animals attacks, birds and pests.

9. PROBLEM ROOT / CAUSE — RC

- Due to insufficient labour forces.
- Due to various environmental factors such as temperature climate, topography and soil quality which results in crop destruction.
- Due to high ammonia, urea, potassium and high PH level fertilizers.
- Crops are damaged and it affects growth.

7. BEHAVIOR + ITS INTENSITY — BE

- Asks suggestions from surrounding peoples and implement the recent technologies.
- Consumes more time in crop land.
- Searching for an alternative solution for an existing solution.

Focus on PR, tap into BE, understand RC

Identify strong TR & EM

3. TRIGGERS TO ACT — TR

- By seeing surrounding Crop land with installing machineries.
- Hearing about innovative technologies and effective solutions.

4. EMOTIONS — EM

- Mental frustrations due to insufficient production of crops.
- Felt smart enough to follow the available technologies with minimum cost.

10. YOUR SOLUTION — SL

- Moisture sensor is interfaced with Arduino MiCroController to measure the moisture level in soil and relay is used to turn ON and OFF the motor pump for managing the exCess water level. It will be updated to authorities through IOT.
- Temperature sensor connected to miCroController is used to monitor the temperature in the field. The optimum temperature required for crop cultivation is maintained using sprinklers.
- IOT based fertilizing methods are followed, to minimize the negative effects on growth of crops while using fertilizers .
- Image proCessing techniques with IOT is followed for crop protection against animal attacks.

8. CHANNELS of BEHAVIOR — CH

ONLINE

- Using different platforms /soCial media to desCribe the working and uses of smart Crop protection deviCe.

OFFLINE

- Giving awareness among farmers about the appliCation of the deviCe.

Extract online & offline CH of BE

4 REQUIREMENT ANALYSIS

4 FUNCTIONAL REQUIREMENT

Sofl'ware Required:

Python IDLE Clarifai Service API

Sysl'em Required:

RAM-Minimum 4GB Processor-Min. Configuration OS-Windows/Linux/MAC

An intelligent crop protection system helps the farmers in protecting the crop from the animals and birds which destroy the crop. This system also helps farmers to monitor the soil moisture levels in the field and also the temperature and humidity values near the field. The motors and sprinklers in the field can be controlled using the mobile application.

4

NON FUNCTIONAL REQUIREMENTS

Prerequisites

- IBM Watson IoT Platform
- Node-RED Service
- Cloudant DB

IBM Cloud Services

- IBM Watson IoT Platform
- Node-RED Service
- Cloudant DB
- Object Storage

Software

Install the Python IDE.

5 PROJECT DESIGN

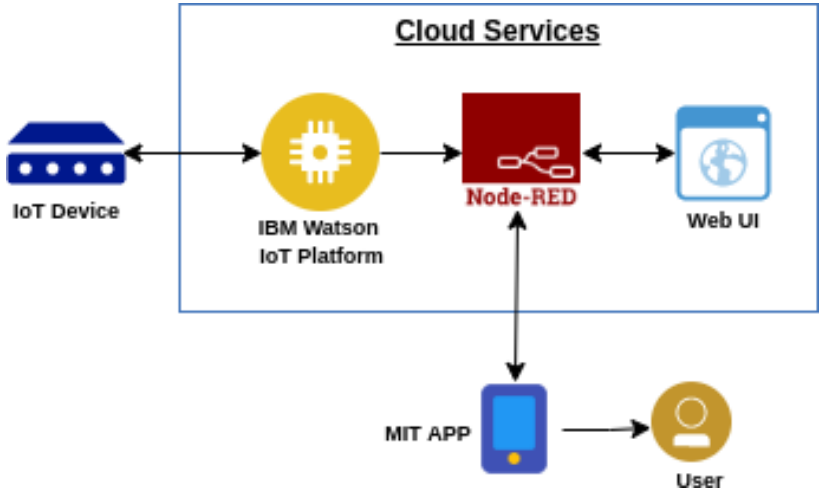
Project Design Phase-II

5 Data Flow Diagram & User Stories

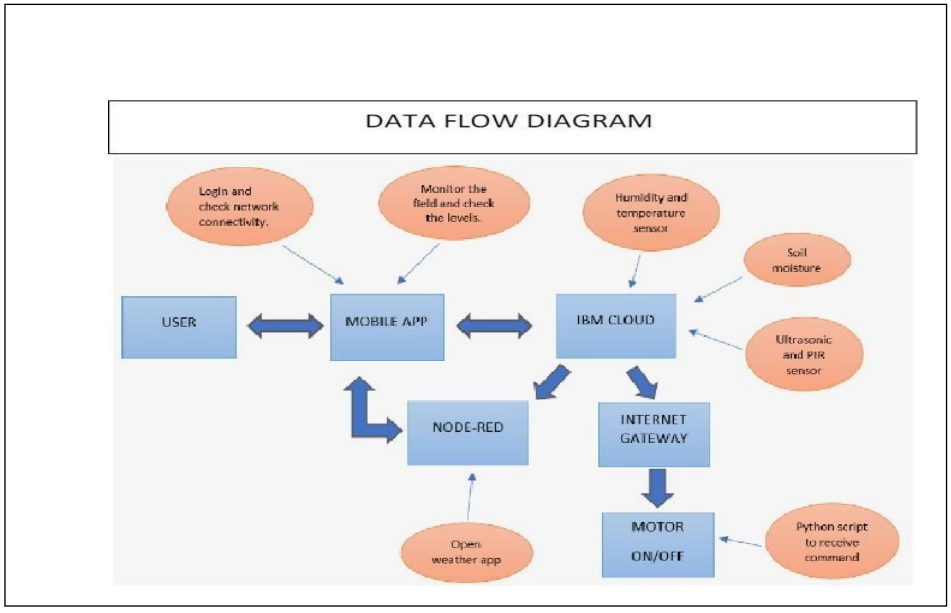
Date	28 October 2022
Team ID	PNT2022TMID15746
Project Name	Project – IoT based smart crop protection for agriculture
Maximum Marks	4 Marks

Data Flow Diagrams: A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

Example: (Simplified)



Example: DFD Level 0 (Industry Standard)



User Stories

Use the below template to list all the user stories for the product.

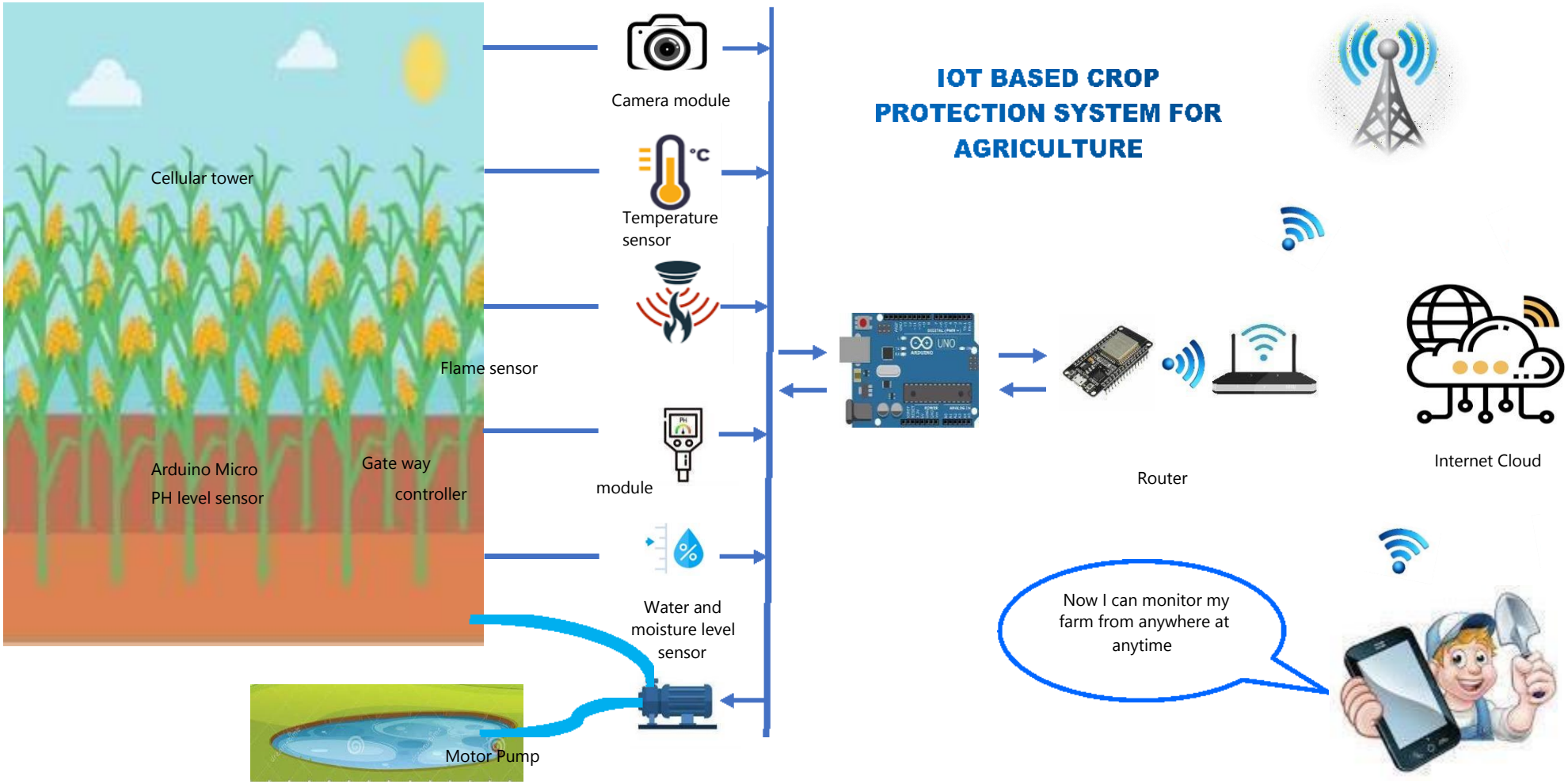
User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
	Mail confirmation	USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
	Facebook access	USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
	register	USN-4	As a user, I can register for the application through Gmail	I can register for the application	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can log into the required application	High	Sprint-1
Customer (Web user)	Same as mobile user	Same as mobile user	Same as mobile user	Same as mobile user	High	Sprint-1
Customer Care Executive	Farmer welfare department	USN-1	As a user, I managing a team of representatives offering customer support	I can communicate to them in proper manner	High	Sprint-1

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
	Agriculture extension department	USN-2	As a user ,I provide administrative support for farmers	I can implementation of agriculture extension activities	High	Sprint-1
Administrator	Farm administrator	USN-1	As a user , I provide administrative support for farmers	I informed about the financial and physical performance	High	Sprint-1
		USN-2	As a user ,I live and work on the farm or an estate	I take responsibility	Medium	Sprint-1

Project Design Phase-1

5.2 Solution Architecture

Date:	04 October 2022
Team ID:	PNT2022TMID32056
Project Name:	IOT BASED CROP PROTECTION SYSTEM FOR AGRICULTURE

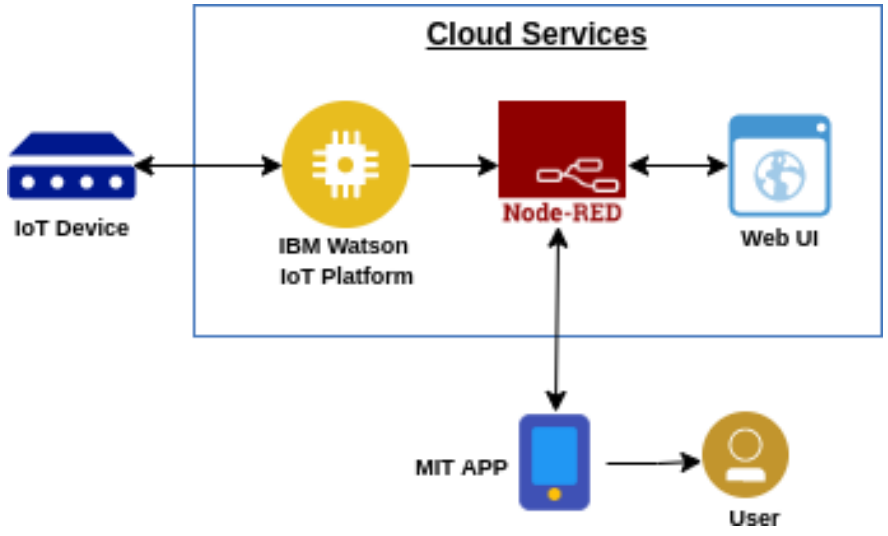


Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	29 October 2022
Team ID	PNT2022TMID15746
Project Name	Project :- IoT based smart crop protection for agriculture
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2



Guidelines:

1. Include all the processes (As an application logic / Technology Block)
2. Provide infrastructural demarcation (Local / Cloud)
3. Indicate external interfaces (third party API's etc.)
4. Indicate Data Storage components / services
5. Indicate interface to machine learning models (if applicable)

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web UI, Mobile App, etc.	Python
2.	Application Logic-1	Logic for a process in the application	Java / Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant ,nodered etc
7.	File Storage	File storage requirements	IBM cloudant
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	*The internet of things system(IoT) refers to the set of devices and systems that systems that stay interconnected with real word sensors and actuators to the internet	Internet of things
2.	Security Implementations	*We can use sensors for detecting surroundings	Sensing technology

S.No	Characteristics	Description	Technology
		*We can use buzzer to alert the farmer	
3.	Scalable Architecture	*it is clearly explained the IoT concept ,crop Damage issues and the need of using smart crop protection system	Internet of things
4.	Availability	*This system is developed using board programmed in embedded C and interfaced with sensing the surroundings	Microchip technology
5.	Performance	*The novelty of the work is that the system automatically alert the farmer by sending sms ,when animals enter into the fields	PIR sensor

6 PROJECT PLANNING & SCHEDULING

6

IOT BASED SMART CROP PROTECTION SYSTEM FOR AGRICULTURE .

Sprint Plan

WEEK 1
22-27 AUG 2022

Preparation Phase

- Pre requisites .
- Environment Setup etc.

WEEK 2 - 4
29 AUG-17 SEP 2022

Ideation Phase

- Literature Survey .
- Empathy map .
- Defining Problem Statement .
- Ideation .

WEEK 5 - 6
19 SEP - 1 OCT 2022

Project Design Phase-I

- Proposed Solution.
- Problem Solution Fit.
- Solution Architecture.

WEEK 7 - 8
3 OCT-15 OCT 2022

Project Design Phase-II

- Requirement Analysis .
- Customer Journey.
- Dataflow diagram.
- Technology Architecture.

WEEK - 9
17 OCT-22 OCT 2022

Project Planning Phase

- Milestones & Activity List.
- Sprint Delivery Plan

WEEK 10 - 13
24 OCT-19 NOV 2022

Project Development Phase

- Coding & Solution
- Acceptance Testing
- Performance Testing.

Team ID : PNT2022TMID15746

6.2

Team ID	PNT2022TMID15746
Project	IoT Based Smart Crop Protection System for Agriculture
Mark	2 marks

Team ID : PNT2022TMID15746

6.3oject Milestone

IoT Based Smart Crop Protection System for Agriculture .

01

1 week

INFORMATION GATHERING

Gather requirements and basic purpose of the project.

02

1-2 Week

ASSIGNING

Assigning task for each person and split the project work based on the technical and project requirements.

03

2-3 Week

DESIGNING

Understanding the functional requirements of the project and create architecture diagram and flow chart. Creating outer layer of UI design.

04

3 week

CODING & TESTING

Create Python code and web interface based on node red js and connect the IOT device by python scripts and report it in web interface.

05

1 week

FINAL RELEASE

Publish of product into market after alpha and beta testing and customer feedback will gathered to improve the project.

Date - 16th Oct 2022.

ACTIVITY LIST

S.No	Activity Title	Activity Description	Duration
1.	Understanding the Project Requirement	Assign the team members & create the repository in github. Assign the task to each members and teach how to use and open access the GitHub and IBM Career Education.	1 Week
2.	Starting of Project	Advice student to attend classes of IBM portal create and develop an rough diagram based on the project description and gather information of IOT and IBM project.	1 week
3.	Attend classes	Team members & team lead must watch and learn from classes provided by IBM and Nalaya thiran and must gain access of MIT license for their project.	4 Week
4.	Budget and scope of the project	Budget & analyse the use of IOT in the project and discuss with the team for budget prediction to predict the favourability of the customer to buy the product for efficient use of the product among the environment.	1 week

7 CODING & SOLUTIONING

SPRINT 1

7. Feature 1

DATE	**14 novembeí 2022**
TEAM ID	**PNT2022TMID15746**
PROJECT NAME	**IOT BASED SMART CROP PROTECTION FOR AGRICULTURE**
MAXIMUM MARK	**20 MARKS**

PROGRAM:

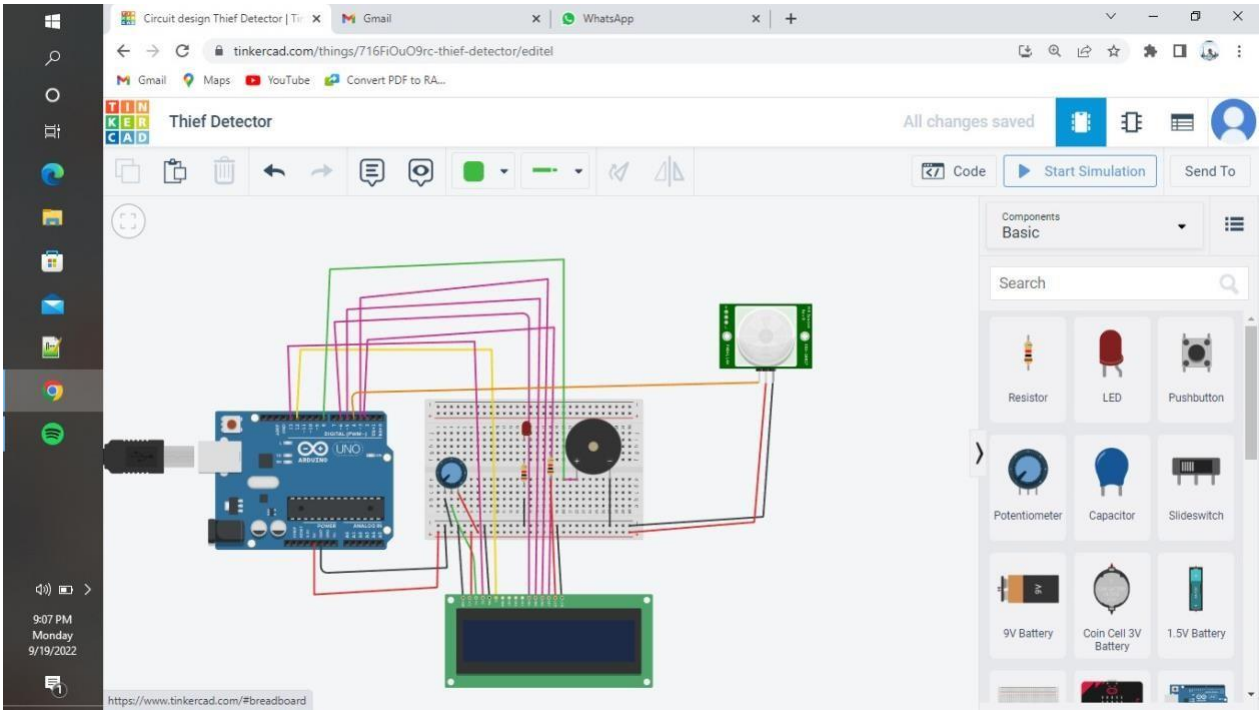
```
#include LiquidCíystal lcd(13,12,6,5,3,2);intled=7;
 int PIR=4;
 int    buzzeí=8;
int     PIRstatus;
void setup()
 {
 lcd.begin(16,2);
 pinMode(led,   OUTPUT);
 pinMode(buzzeí,
 OUTPUT);   pinMode(PIR,
 INPUT); lcd.cleaí();
 }
void loop()
{
  PIRstatus=digitalRead(PIR);   if
  (PIRstatus==HIGH)
{
 lcd.cleaí();
 }
void loop()
```

SPRINI’
1

```
{
  PIRstatus=digitalRead(PIR);   if
  (PIRstatus==HIGH)
{
 lcd.cleaí();   digitalWíite(led,
HIGH);    digitalWíite(buzzeí,
HIGH);   digitalWíite(buzzeí,
HIGH);   tone(buzzeí,   300,
10000);    lcd.setCuísoí(0,1);
lcd.píint("ALERI");
delay(7000);
  lcd.cleaí();
  }
 else
  {
lcd.setCuísoí(0,              0);
 lcd.píint("SAFE");
 digitalWíite(led,      LOW);
 digitalWíite(buzzeí,  LOW);
}
 delay(1000);
}
```

OUI’PUI’:

SPRINT 1



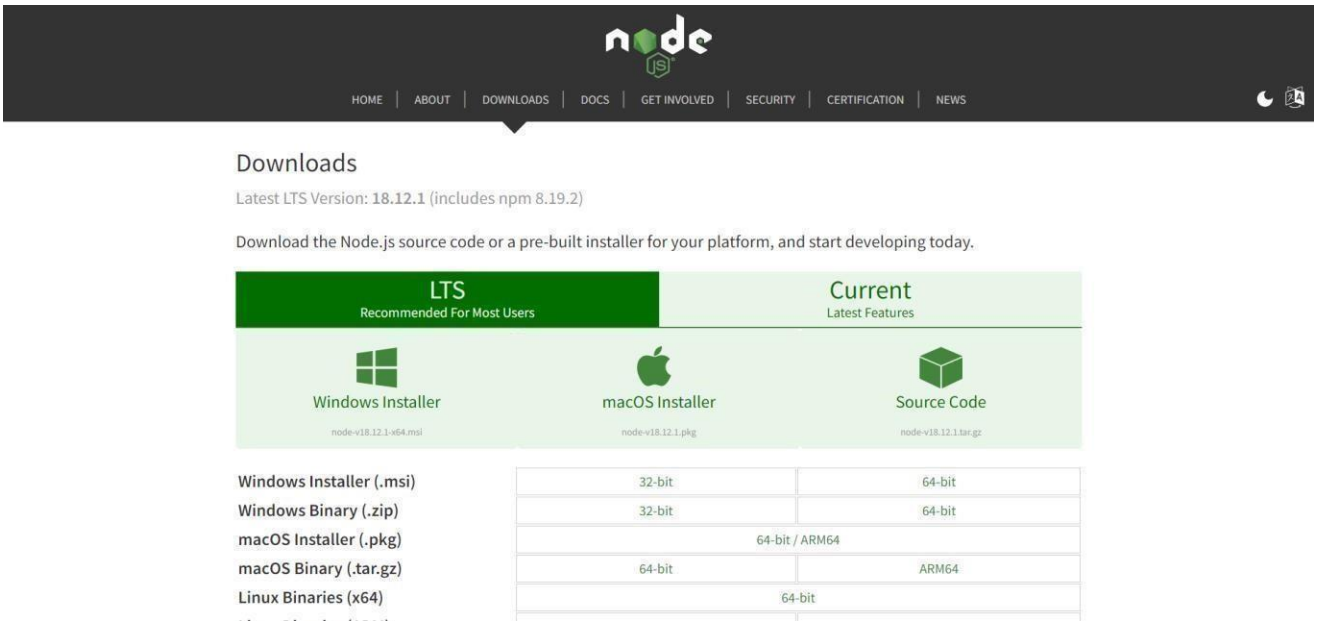
PURPOSE:

This will be used to sense tha animal oí any otheí object thíough the sensoí and it will connect to the aíduino . Any animal oí object they will staít up to alaím sound and the LED will be on.

SPRINT-2

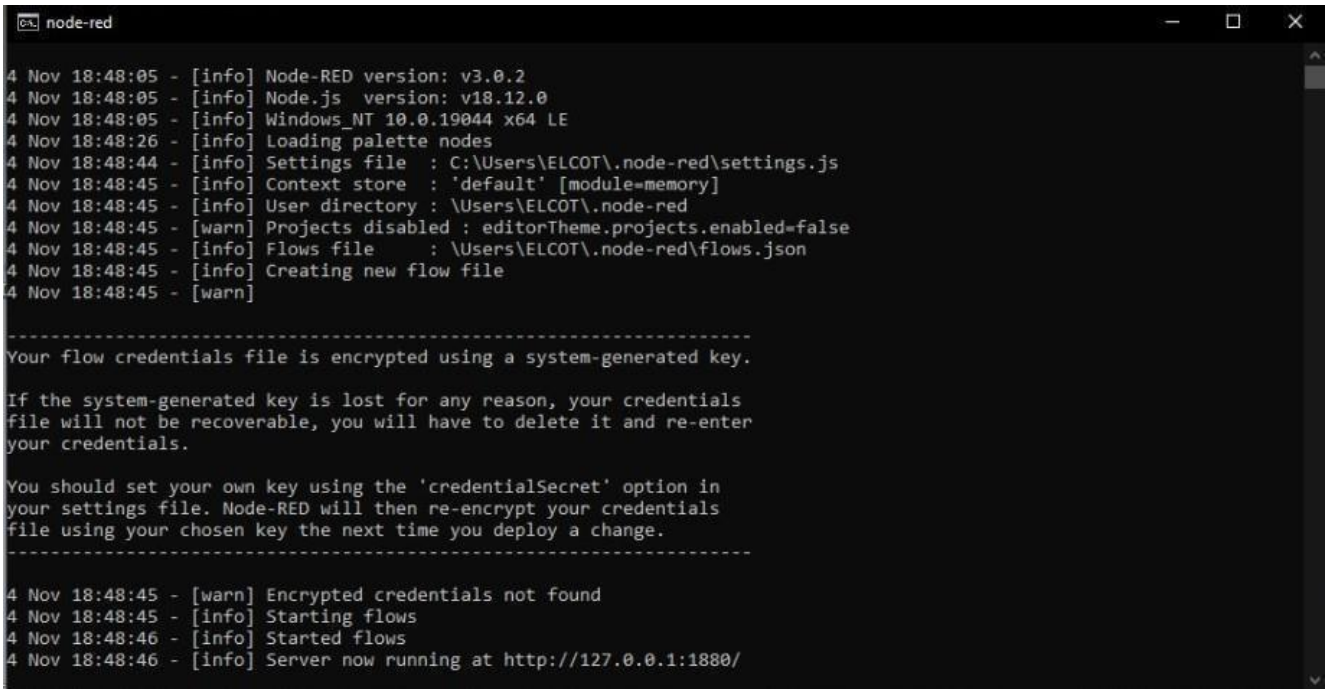
TEAM ID	PNT2022TMID15746
Project Name	IoT Based smart crop Protection system for agriculture
Maximum mark	20 marks

STEP1: Download and Install NODE JS.

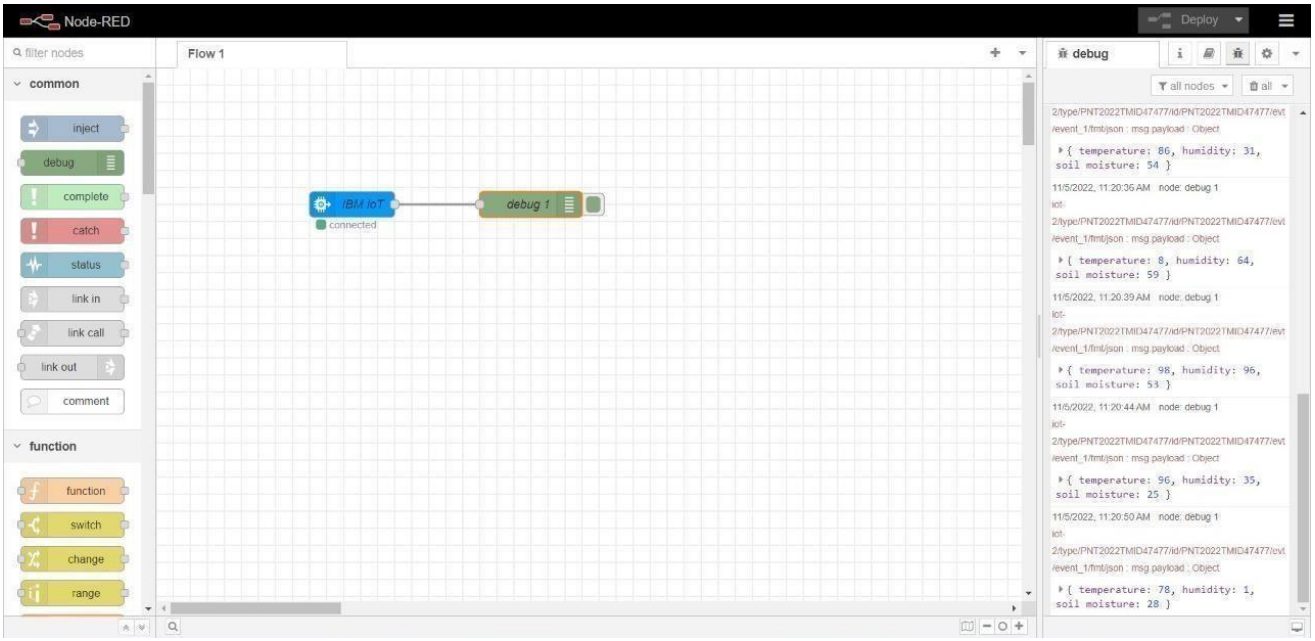


STEP2: Setup node.js and configure command prompt for error check.open node-red from the generated link.

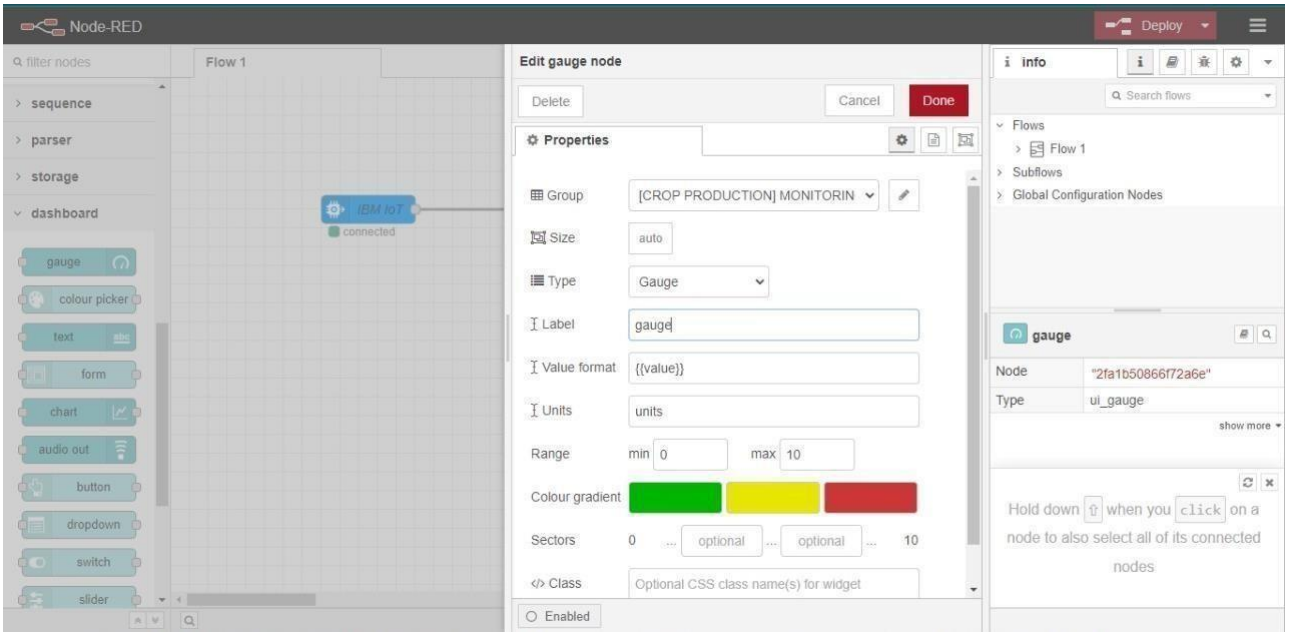
7. Database Schema (Node-red)

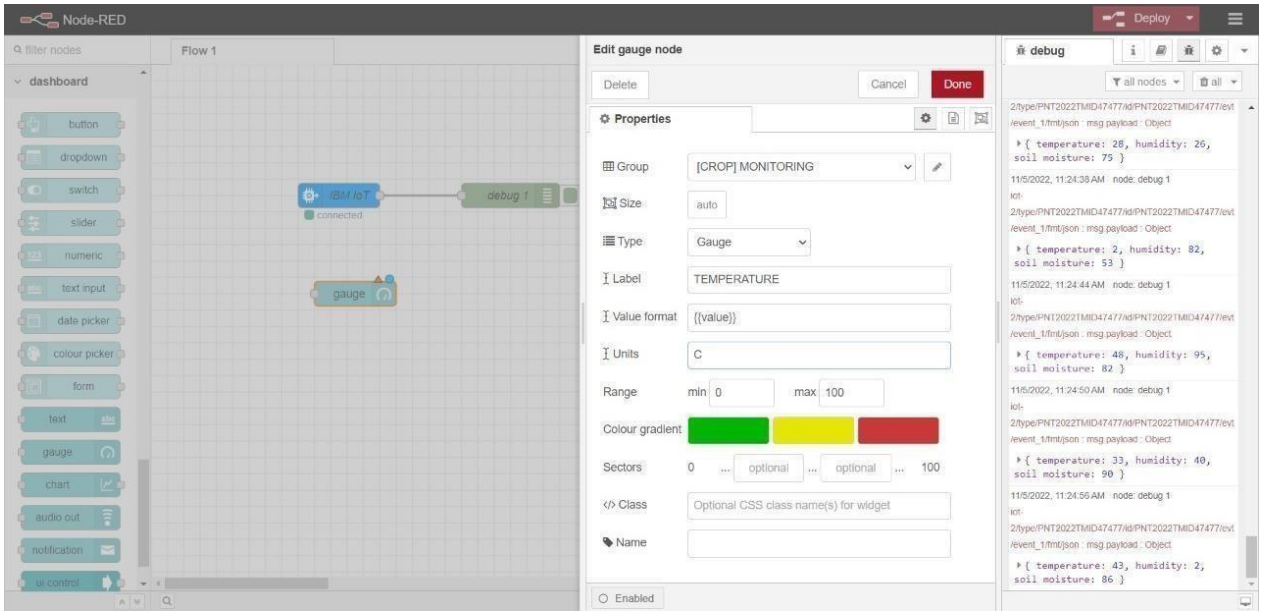


STEP3: Connect IBM IOT in and Debug 1 and Deploy.



STEP4: Edit gauge node (Here the gauge nodes are named as Temperature, Humidity and Soil moisture).

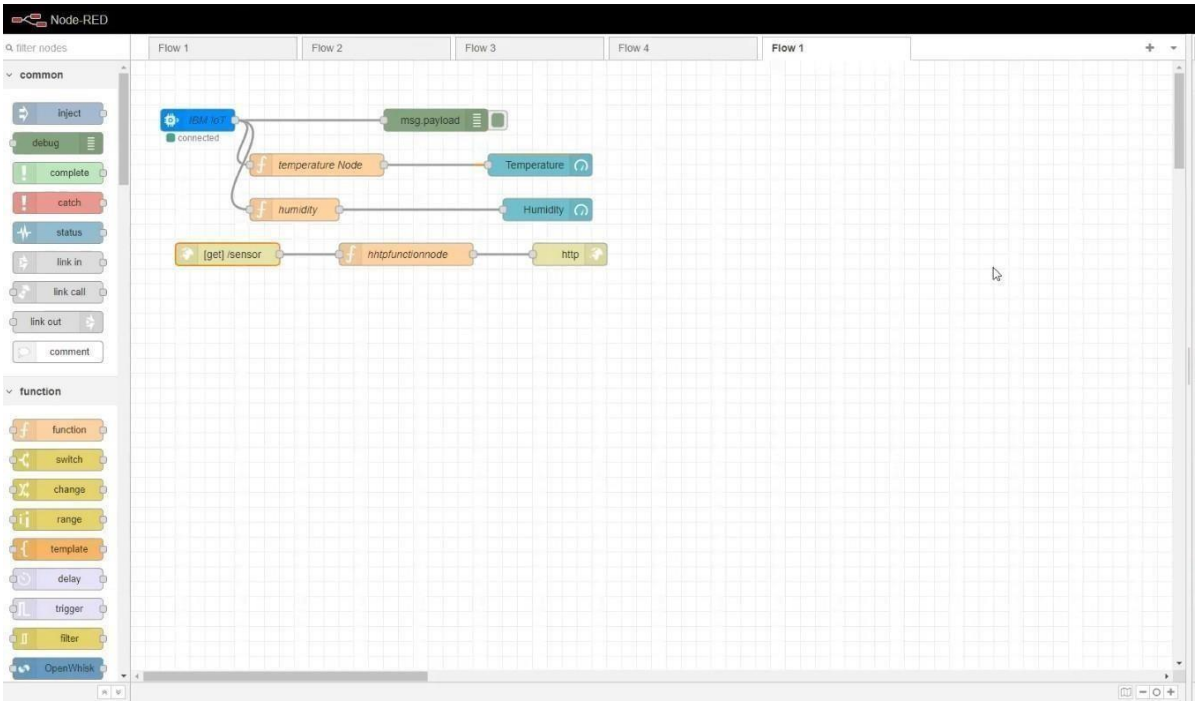

Node-RED
Deploy
filter nodes
Flow 1
sequence
parser
storage
dashboard
gauge
colour picker
text
form
chart
audio out
button
dropdown
switch
slider
IBM IoT
connected
Edit gauge node
Delete
Cancel
Done
Properties
Group
[CROP PRODUCTION] MONITORIN
Size
auto
Type
Gauge
Label
gauge
Value format
{{value}}
Units
units
Range
min 0
max 10
Colour gradient
Sectors
0 ... optional ... optional ... 10
Class
Optional CSS class name(s) for widget
Enabled
info
Search flows
Flows
Flow 1
Subflows
Global Configuration Nodes
gauge
Node
"2fa1b50866f72a6e"
Type
ui_gauge
show more
Hold down ⇧ when you click on a node to also select all of its connected nodes

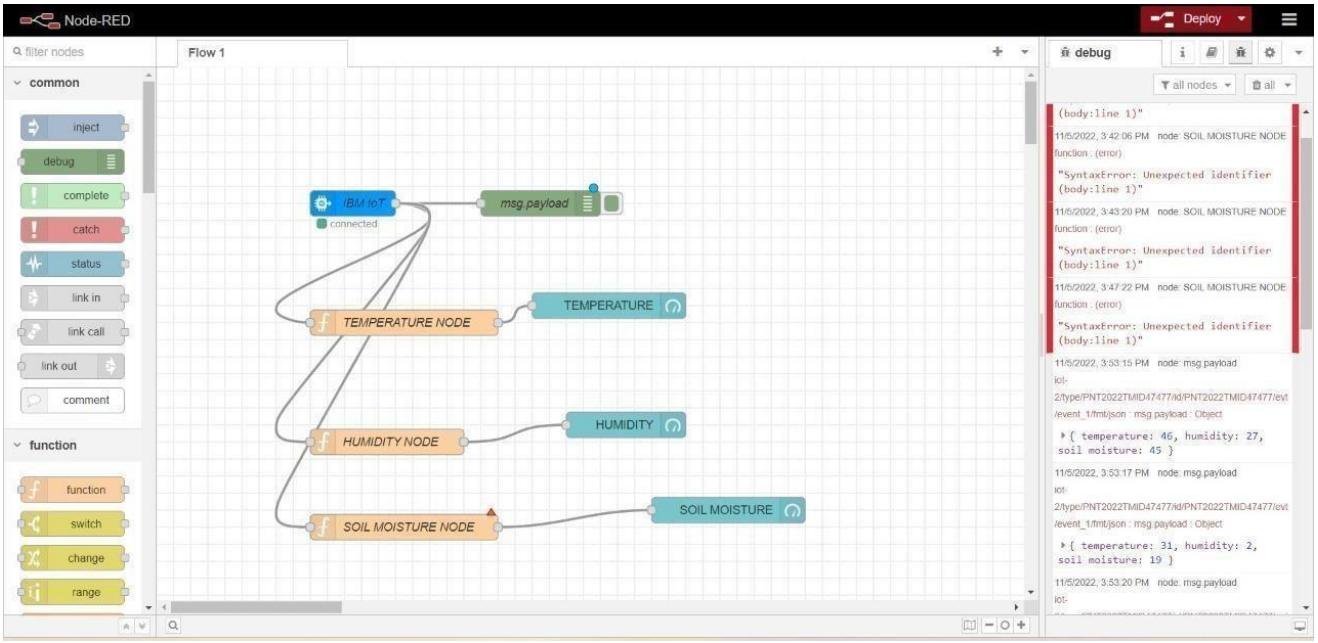

Node-RED
Deploy
filter nodes
Flow 1
dashboard
button
dropdown
switch
slider
numeric
text input
date picker
colour picker
form
text
gauge
chart
audio out
notification
ui control
IBM IoT
connected
debug 1
gauge
Edit gauge node
Delete
Cancel
Done
Properties
Group
[CROP] MONITORING
Size
auto
Type
Gauge
Label
TEMPERATURE
Value format
{{value}}
Units
C
Range
min 0
max 100
Colour gradient
Sectors
0 ... optional ... optional ... 100
Class
Optional CSS class name(s) for widget
Name
Enabled
debug
all nodes
all
{ temperature: 28, humidity: 26, soil moisture: 75 }
11/5/2022, 11:24:38 AM node: debug 1
{ temperature: 2, humidity: 82, soil moisture: 53 }
11/5/2022, 11:24:44 AM node: debug 1
{ temperature: 48, humidity: 95, soil moisture: 82 }
11/5/2022, 11:24:50 AM node: debug 1
{ temperature: 33, humidity: 40, soil moisture: 90 }
11/5/2022, 11:24:56 AM node: debug 1
{ temperature: 43, humidity: 2, soil moisture: 86 }

SPRINT-3

TEAM ID	PNT2022TMID15746
Project Name	IoT Based smart crop Protection system for agriculture
Maximum mark	20 marks

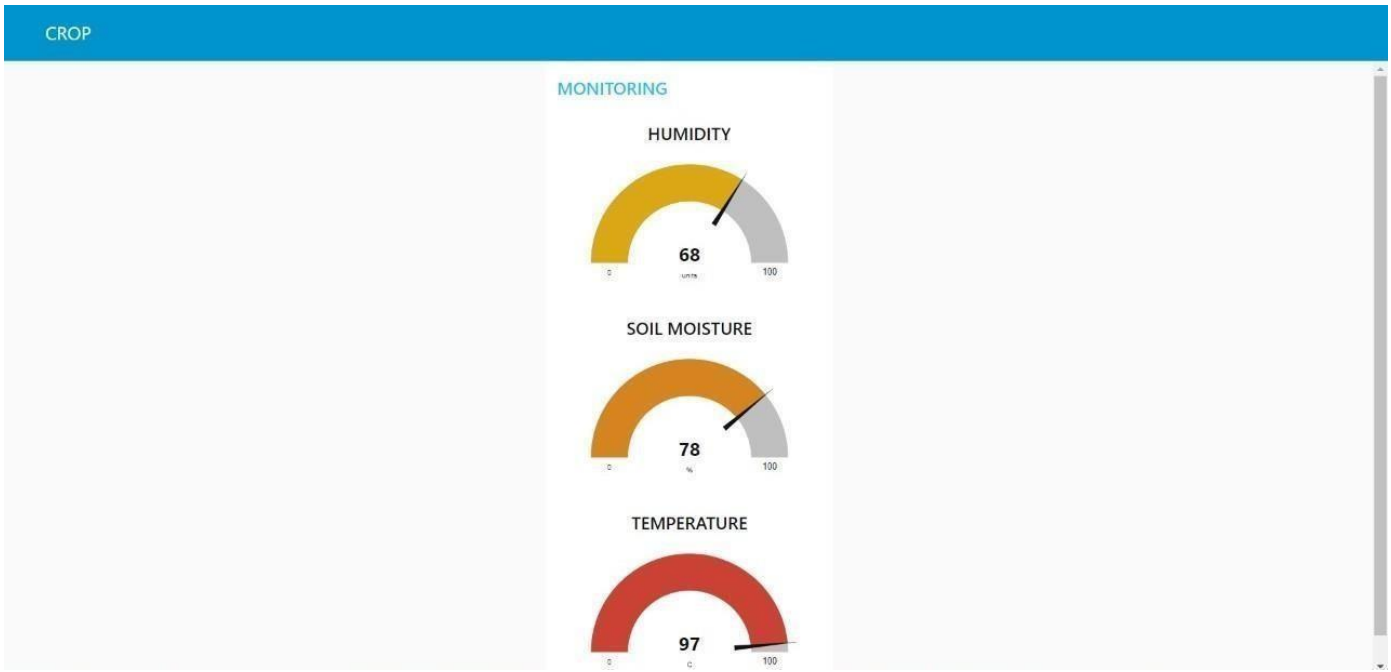
STEP1: Simulated program to get the random values.





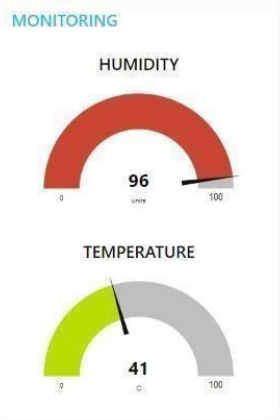
STEP2: Generate debug message from IBM Watson IoT Platform and connect the nodes.

STEP3: Generate the some output from recent events.



CROP

MONITORING

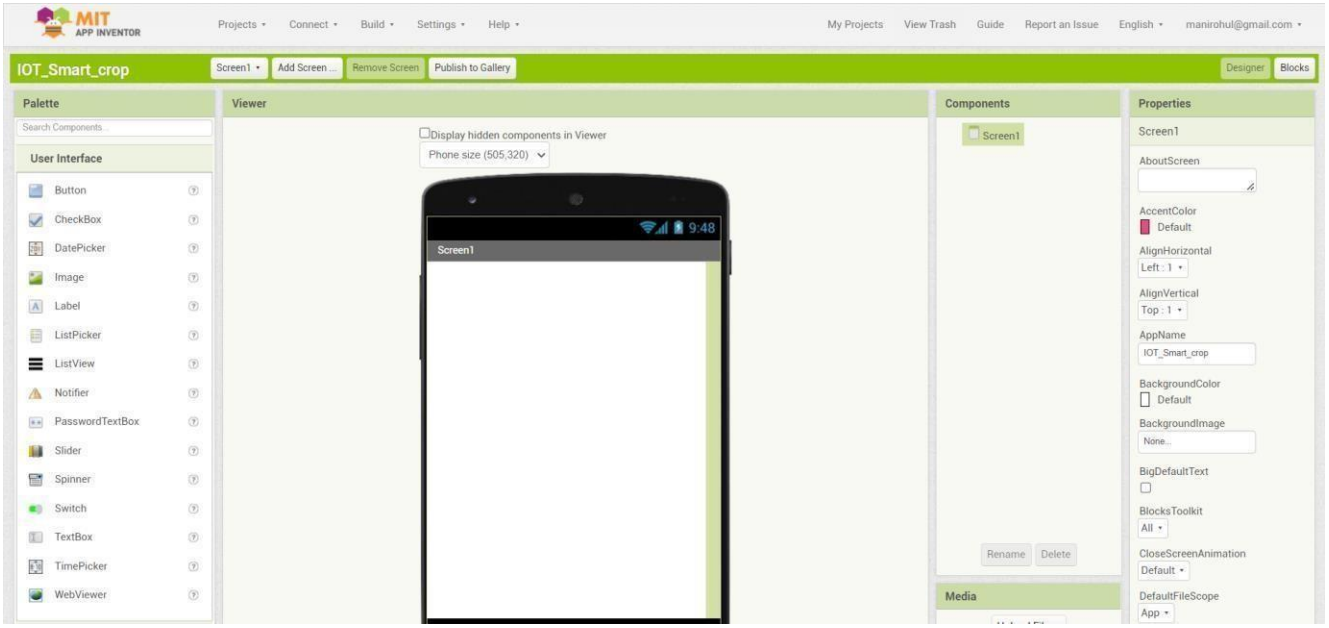


SPRINT-4

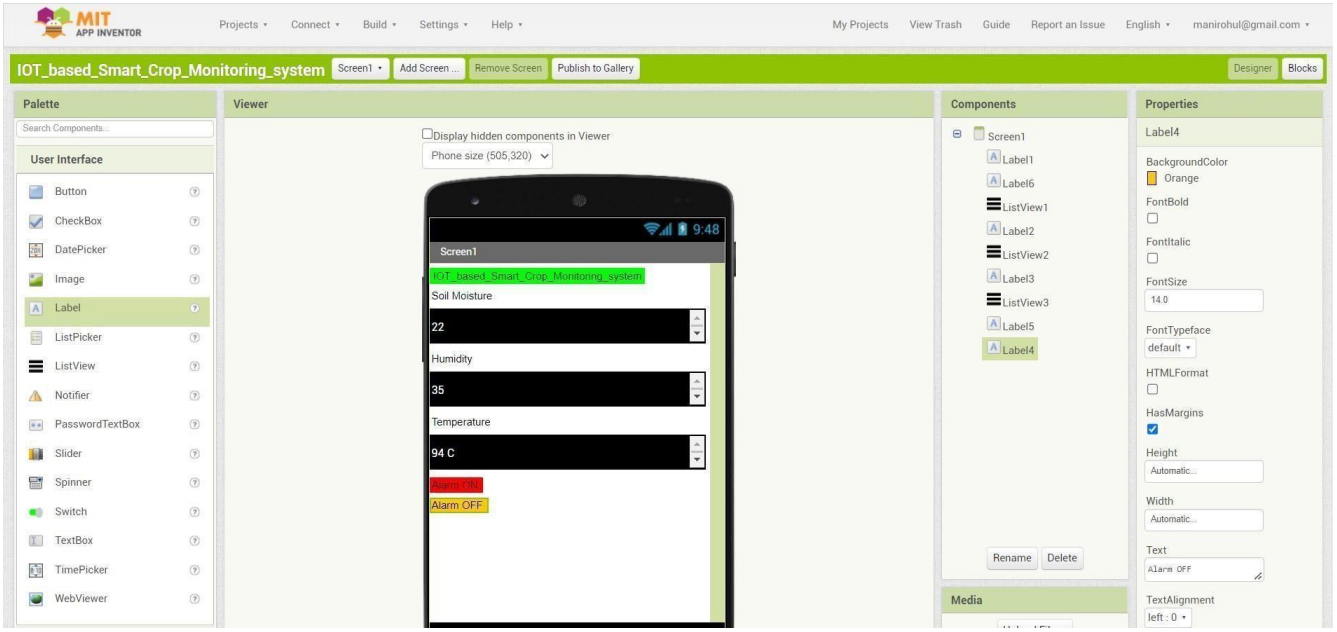
7. Feature 2

TEAM ID	PNT2022TMID15746
Project Name	IoT Based smart crop Protection system for agriculture
Maximum mark	20 marks

STEP 1: MIT APP inventor to design the APP.

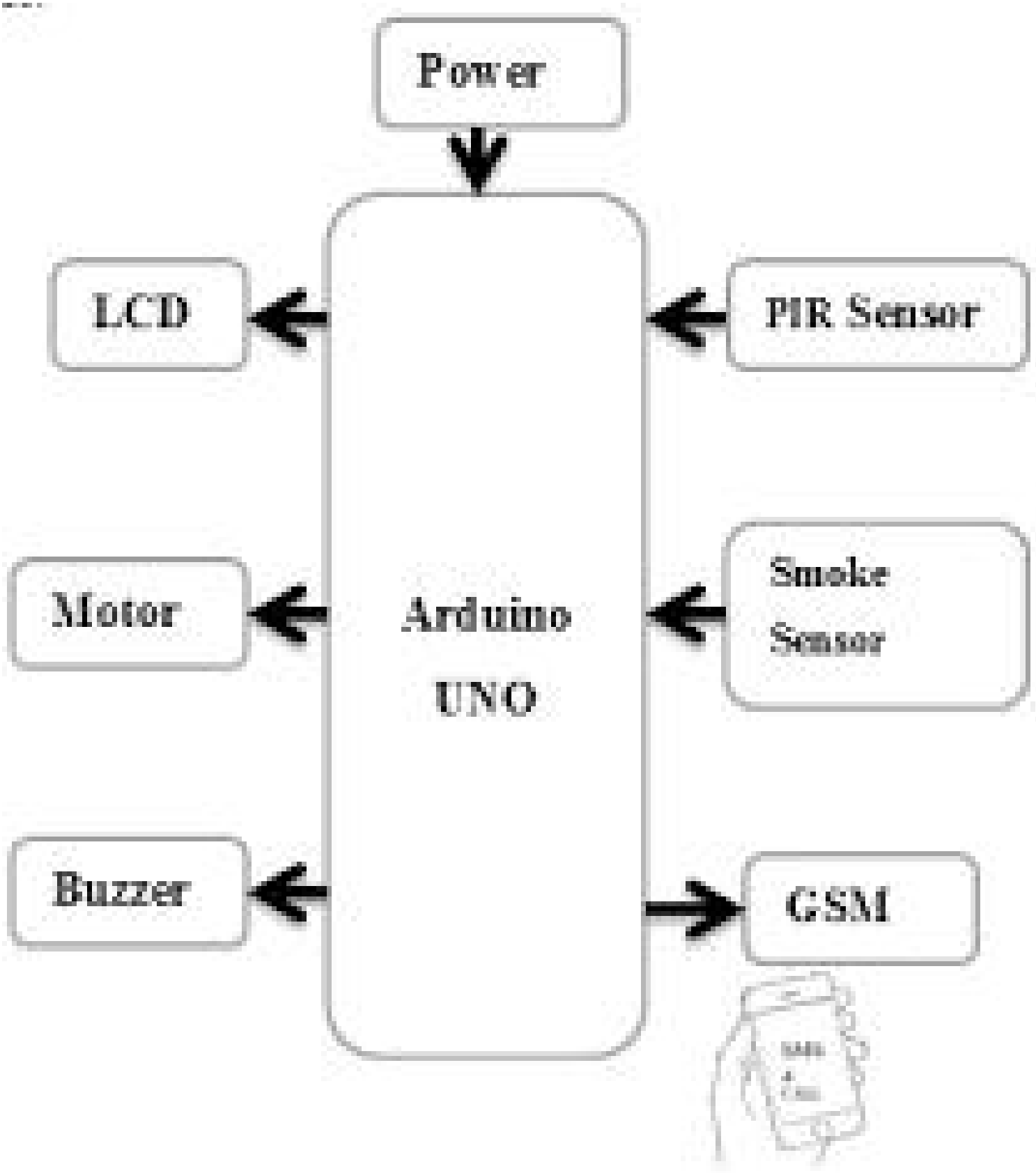


STEP 2: Customize the App interface to Display the Values.


MIT APP INVENTOR
Projects
Connect
Build
Settings
Help
My Projects
View Trash
Guide
Report an Issue
English
manirohul@gmail.com
IOT_based_Smart_Crop_Monitoring_system
Screen1
Add Screen ...
Remove Screen
Publish to Gallery
Designer
Blocks
Palette
Search Components...
User Interface
Button
CheckBox
DatePicker
Image
Label
ListPicker
ListView
Notifier
PasswordTextBox
Slider
Spinner
Switch
TextBox
TimePicker
WebViewer
Viewer
Display hidden components in Viewer
Phone size (505,320)
9:48
Screen1
IOT_based_Smart_Crop_Monitoring_system
Soil Moisture
22
Humidity
35
Temperature
94 C
Alarm ON
Alarm OFF
Components
Screen1
Label1
Label6
ListView1
Label2
ListView2
Label3
ListView3
Label5
Label4
Rename
Delete
Media
Properties
Label4
BackgroundColor
Orange
FontBold
FontItalic
FontSize
14.0
FontTypeface
default
HTMLFormat
HasMargins
Height
Automatic...
Width
Automatic...
Text
Alarm OFF
TextAlignment
left : 0

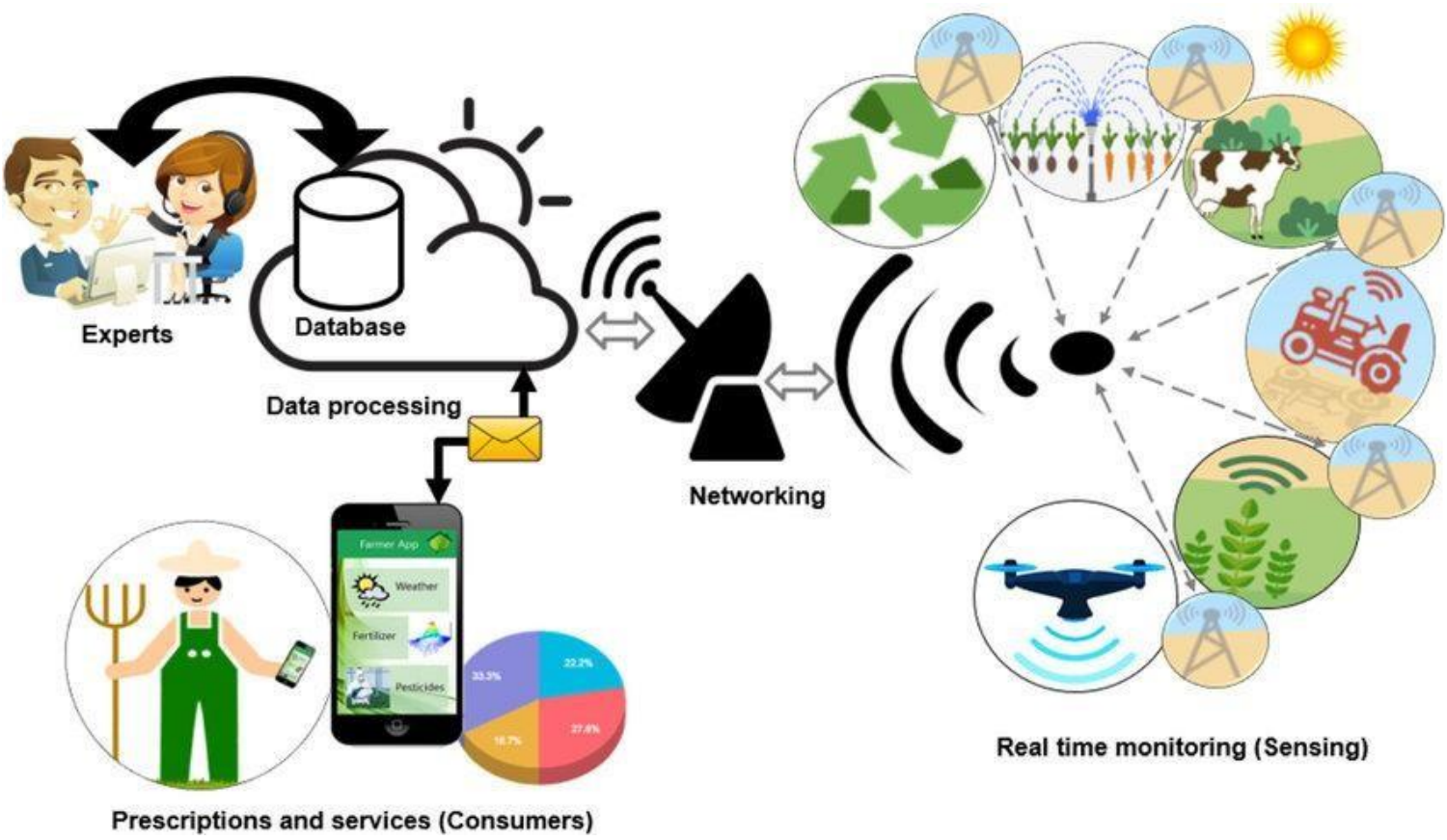
8 TESTING

8.1 & 8.2 Testcases and User Acceptance Testin



9 RESULTS

9. Performance



10 ADVANTAGES

- Smart Logistics
- Smart Pest Management
- Accurate Weather Predictability
- Predictive Analysis for Crops
- Remote Monitoring
- Sensor-based Field and Resource Mapping
- Intelligent Irrigation System
- Drone Monitoring
- Stats on Livestock Feeding
- Smart Greenhouses

DISADVANTAGES

➨The smart agriculture needs availability of internet continuously. Rural part of most of the developing countries do not fulfil this requirement. Moreover internet connection is slower.

➨The smart farming based equipments require farmers to understand and learn the use of technology. This is major challange in adopting smart agriculture farming at large scale across the countries

11 Conclusion:

Smart farming is key to developing sustainable agriculture.

Smart farming can provide a concerted path out of locked-in technologies and practices characterized by strong polarization and market segmentation.

12 Future scope:

Conventional supply chains have been chaiacteiized by a powei imbalance with faimeis often having less powei because they've had less infoimation about how theii pioduct peifoims ielative to customei iequiiements. Smait faiming piovides a vital link between all playeis in the supply chain by enabling the e cient and equitable flow of infoimation and in doing so, facilitating bettei decision making. This has the potential to iebalance powei and iedistiibute piofits moie equitably thioughout the supply chain.

13.Appendix

https://drive.google.com/file/d/1dKiBS-53xwwzFT64jGBQaI-yShz0VSlJ/view?usp=share_link