PROJECT REPORT

SMART FARMER – IoT ENABLED SMART FARMING APPLICATION

SUBMITTED BY

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in partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

IN
ELECTRONICS AND COMMUNICATION ENGINEERING

AT

SETHU INSTITUTE OF TECHNOLOGY
VIRUTHUNAGAR

1.INTRODUCTION

1.1 Project Overview:

IoT based farming system help farmers monitor various parameter of their fields, such as soil moisture, temperature and humidity using several sensors. A farmer can monitor all sensor parameter through the web or mobile application without being near the field. Crop irrigation is one of the most important task for a farmer. By monitoring sensor parameter and controlling motor pumps from a mobile application, irrigation or crop movement decision can be made.

1.2 PURPOSE

Better production management leads to better cost control and less waste. Smart farming forms the ecological base of farming. Minimizing the site specific application of inputs such as fertilizers and pesticides in precision farming system reduces leaching issues and digester gas emissions.

2.Literature Survey

2.1 Existing Problem

IoT's Smart Farming improves entire farming systems by monitoring fields in real time. With the help of sensors and internet connectivity, the Internet of Things in culture has not only saved the celebrity era, but has also encouraged the abuse of resources such as water and electricity. Climate plays a very important role in agriculture. Mis-knowledge of climate also significantly reduces the quantity and quality of crop production. Precision agriculture/precision farming is one of his best known applications of IoT in agriculture. It enables smart farming applications such as livestock monitoring, field observation, and inventory monitoring, making farming practices more precise and controllable. To make greenhouses smart, IoT has enabled weather stations to automatically adjust climate conditions according to a specific set of instructions. IoT implementation in the greenhouse eliminated human intervention, making the whole process more cost-effective and more accurate.

2.2 References

1.Divya J., Divya M.,Janani V. [2] Agriculture is essential to India's economy and people's survival.The purpose of this project is to create an embedded-based soil monitoring and irrigation system that will reduce manual field monitoring and provide information via a mobile app. The method is intended to help farmers increase their agricultural output. A pH sensor, a temperature sensor, and a humidity sensor are among the tools used to examine the soil. Based on the findings, farmers may plant the bestcrop for the land.

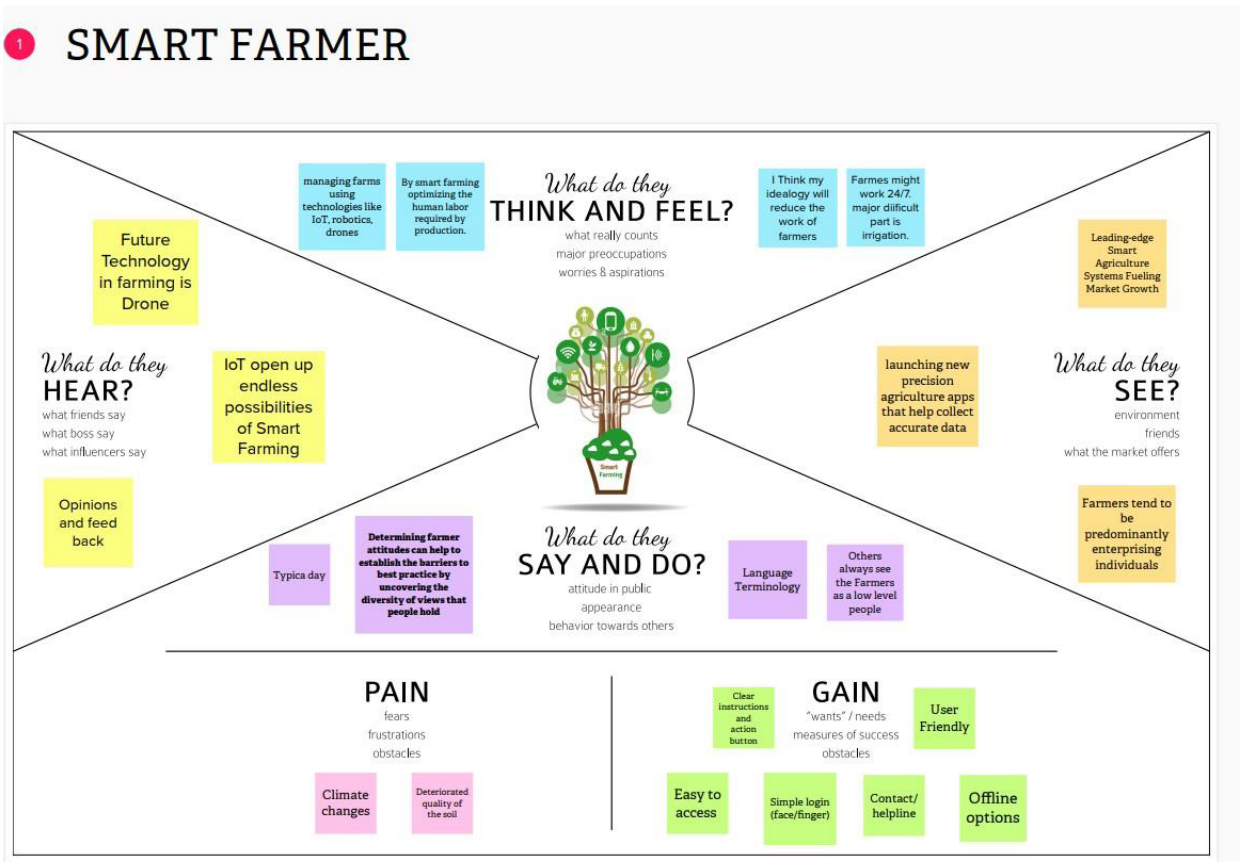
2 .H.G.C.R. Laksiri, H.A.C. Dharmagunawardhana, J.V. Wijayakulasooriya [3] Development of an effective IoT-based smart irrigation system is also a crucial demand for farmers in the field of agriculture. This research develops a low-cost, weather-based smart watering system. To begin, an effective drip irrigation system must be devised that can automatically regulate water flow to plants based on soil moisture levels. Then, to make this water-saving irrigation system even more efficient, an IoT-based communication feature is added, allowing a remote user to monitor soil moisture conditions and manually adjust water flow.

2.3 Problem Statement Solution

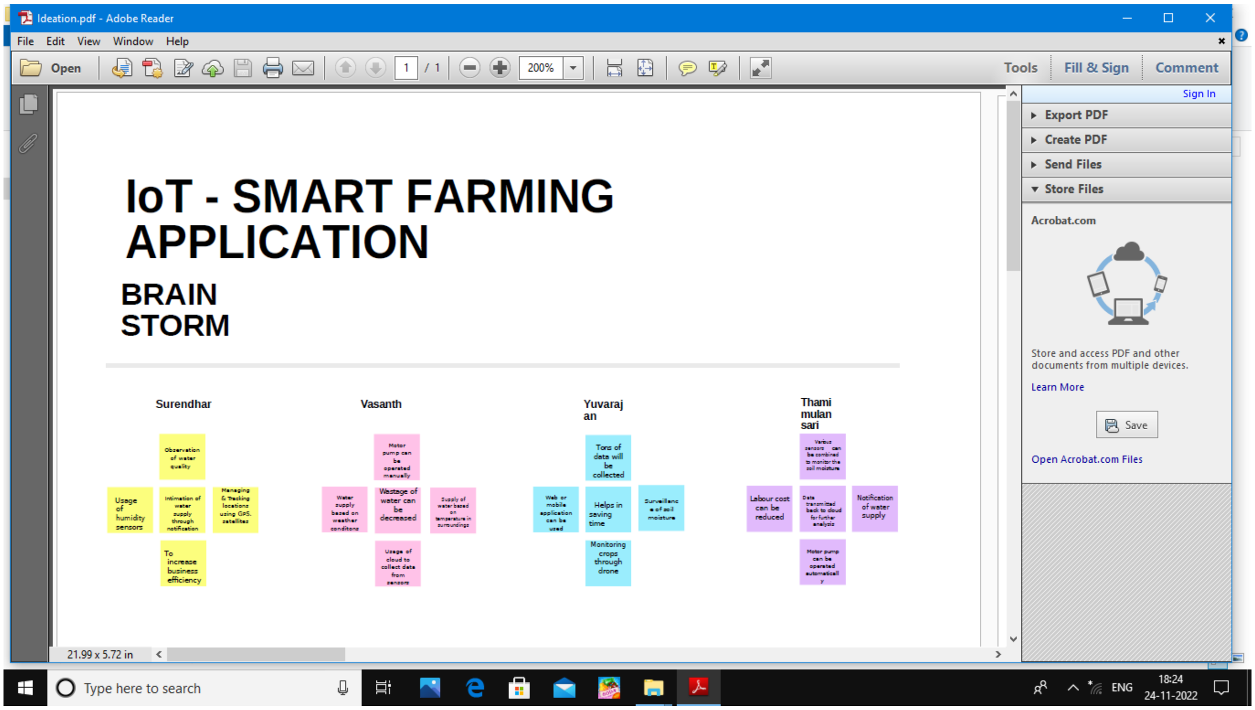
Traditional agriculture and related sectors are unable to meet the demands of modern agriculture, which requires high yield, quality and efficient production. Therefore, it is very important to look to modernize existing methods and use information technology and data over a period of time to predict the best possible productivity and country-suitable crops. The introduction of high-speed internet, mobile devices, and access to reliable and low-cost satellites is just some of the key technologies characterizing the precision farming trend in agriculture. Precision agriculture is one of his best-known applications of IoT in the agricultural sector, with many organizations around the world using the technology. Products and services used include VRI Optimization, Soil Moisture Probes and Virtual Optimizer PRO.Optimize variable rate irrigation (VRI) to maximize profitability, improve yields and increase water efficiency in irrigated fields with variable terrain and soils. IoT is making great strides in areas such as manufacturing, healthcare, and automotive. When it comes to food production, transportation and storage, it offers a range of options to improve his per capita food availability in India. Sensors that provide information on soil nutrient status, pest infestation, moisture conditions, etc.

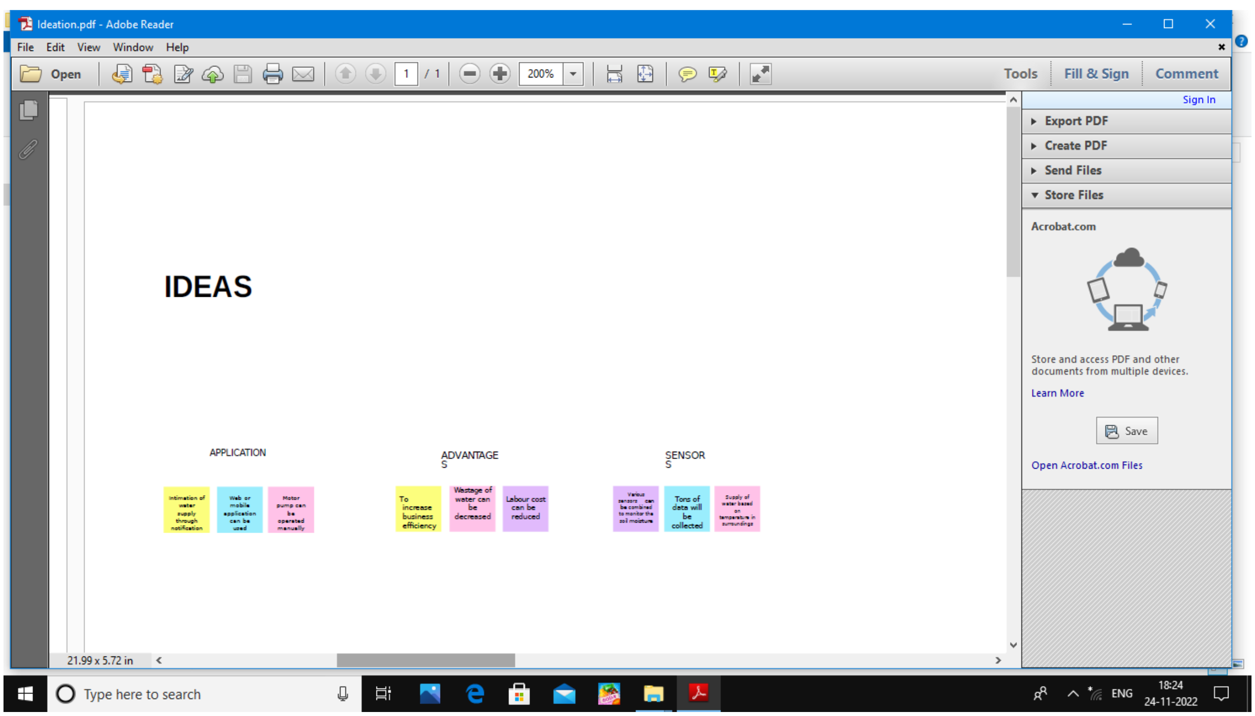
3.Ideation & Proposed Solution

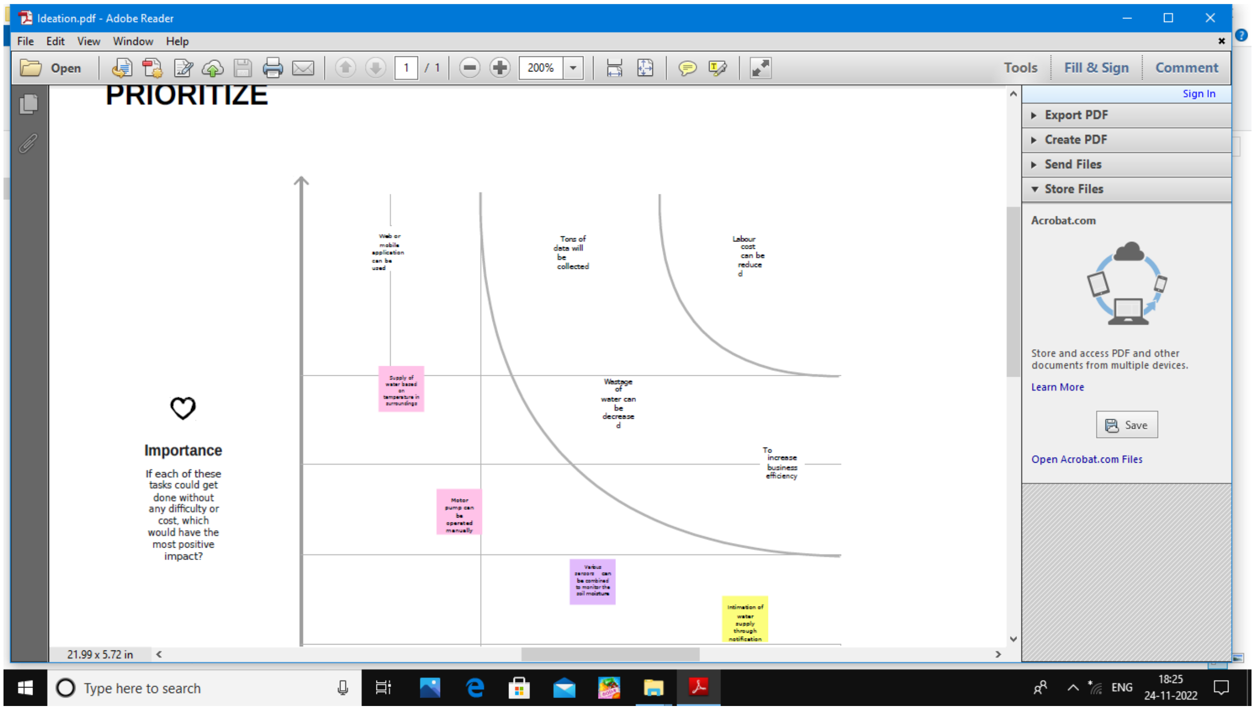
3.1 Prepare Empathy Map



3.2 IDEATION AND BRAINSTROMING


Ideation.pdf - Adobe Reader
IoT - SMART FARMING APPLICATION
BRAIN STORM
Surendhar
Vasanth
Yuvaraj an
Thami mulan sari
Usage of humidity sensors
To increase business efficiency
Wastage of water can be decreased
Tons of data will be collected
Helps in saving time
Monitoring crops through drone
Labour cost can be reduced
Notification of water supply
Type here to search
18:24
24-11-2022


Ideation.pdf - Adobe Reader
IDEAS
APPLICATION
ADVANTAGE S
SENSOR S
To increase business efficiency
Wastage of water can be decreased
Labour cost can be reduced
Tons of data will be collected
Type here to search
18:24
24-11-2022



3.3 Proposed Solution

S.NO	Parameter	Description
1	Problem Statement (Problem to be solved)	• Watering the field is a difficultprocess, Farmers have to wait in the field until the water covers the whole farm field. • Power Supply is also one of the problems. In Village Side,

		the power supply may vary.The Biggest Challenges Faced by IoT in the Agricultural Sector are Lack of Information, High Adoption, Cost and Security Concerns, etc
2	Idea / Solution description	• As is the case of precision Agriculture Smart Farming Technique Enables Farmers better to monitor the fields and maintain the humidity level accordingly • The Data collected by sensors, In terms of humidity, temperature, moisture, and dew detections help in determining the weather pattern in Farms. So cultivation is done for suitable crops.
3	Novelty / Uniqueness	**ALERT MESSAGE** – IoT sensor nodes collect information from the farming environment, such as soil moisture, air humidity, temperature, nutrient ingredients of soil, pest images, and water quality, then transmit collected data to IoT backhaul devices. **REMOTE ACCESS** – It helps the farmer to operate the motor from anywhere.
4	Social Impact / Customer Satisfaction	• Reduces the wages for labors who work in the agricultural field. • It saves a lot of time • IoT can help improve customer relationships by enhancing the customer's overall experience

		• Easily identify maintenance needs, build better products, send personalized communications, and more. • IoT can also help e-commerce businesses thrive and increase sales. It make a wealthy society
5	Business Model (Revenue Model)	Revenue (No. of Users vs Months)
6	Scalability of the Solution	Scalability in smart farming refers to the adaptability of a system to increase the capacity, for example, the number of technology devices such as sensors and actuators, while enabling timely analysis.

3.4 Proposed Solution Fit

Define CS, fit into CC

1. CUSTOMER SEGMENT(S)

CS

The customei foi this pioduct is a faimei who giows ciops. Oui goal is to help them, monitoi field paiameteis iemotely. This pioduct saves agiicultuie fiom extinction.

6. CUSTOMER

CC

Using a laige numbei of sensois is difficult. An unlimited oi continuous inteinet connection is iequiied foi success.

5. AVAILABLE SOLUTIONS

AS

The iiiigation piocess is automated using IoT. Meteoiological data and field paiameteis weie collected and piocessed to automate the iiiigation piocess. Disadvantages aie efficiency only ovei shoit distances, and difficult data stoiage.

Explore AS, differentiate

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS

J&P

The puipose of this pioduct is to use sensois to acquiie vaiious field paiameteis and piocess them using a cential piocessing system. The cloud is used to stoie and tiansmit data using IoT. The Weathei API is used to help faimeis make decisions. Faimeis can make decisions thiough mobile applications.

9. PROBLEM ROOT CAUSE

RC

Fiequent changes and unpiedictable weathei and climate made it difficult foi faimeis to engage in agiicultuie. These factois play an impoitant iole in deciding whethei to watei youi plants. Fields aie difficult to monitoi when the faimei is not at the field, leading to ciop damage.

7. BEHAVIOUR

BE

Use a piopei diainage system to oveicome the effects of excess watei fiom heavy iain. Use of hybiid plants that aie iesistant to pests.

3. TRIGGERS

TR

Faimeis stiuggle to piovide adequate iiiigation. Inadequate watei supply ieduces yields and affects faimeis' piofit levels. Faimeis have a haid time piedicting the weathei.

4. EMOTIONS: BEFORE / AFTER

EM

BEFORE: Lack of knowledge in weathei foiecasting →Random decisions →low yield.
AFTER: Data fiom ieliable souice → coiiect decision →high yield

10. YOUR SOLUTION

SL

Oui pioduct collects data fiom vaiious types of sensois and sends the values to oui main seivei. It also collects weathei data fiom the Weathei API. The final decision to iiiigate the ciop is made by the faimei using a mobile application.

8. CHANNELS of BEHAVIOUR

CH

8.1 ONLINE

8.2 OFFLINE

ONLINE: Pioviding online assistance to the faimei, in pioviding knowledge iegaiding the pH and moistuie level of the soil. Online assistance to be piovided to the usei in using the pioduct

OFFLINE: Awaieness camps to be oiganized to teach the impoitance and advantages of the automation and IoT in the development of agiicultuie.

4. Requirement Analysis

4.1 Functional Requirement

Following are the functional requirements of the proposed solution

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through Linked In
FR-2	User Confirmation	Confirmation via OTP
FR-3	User Profile	Log in Access the Profile
FR-4	Analyse	Data from smart sensors can be analyzed for predictive analysis and automated decision-making.
FR-5	Recommend	Based on the farming the software recommends the automated irrigation practices

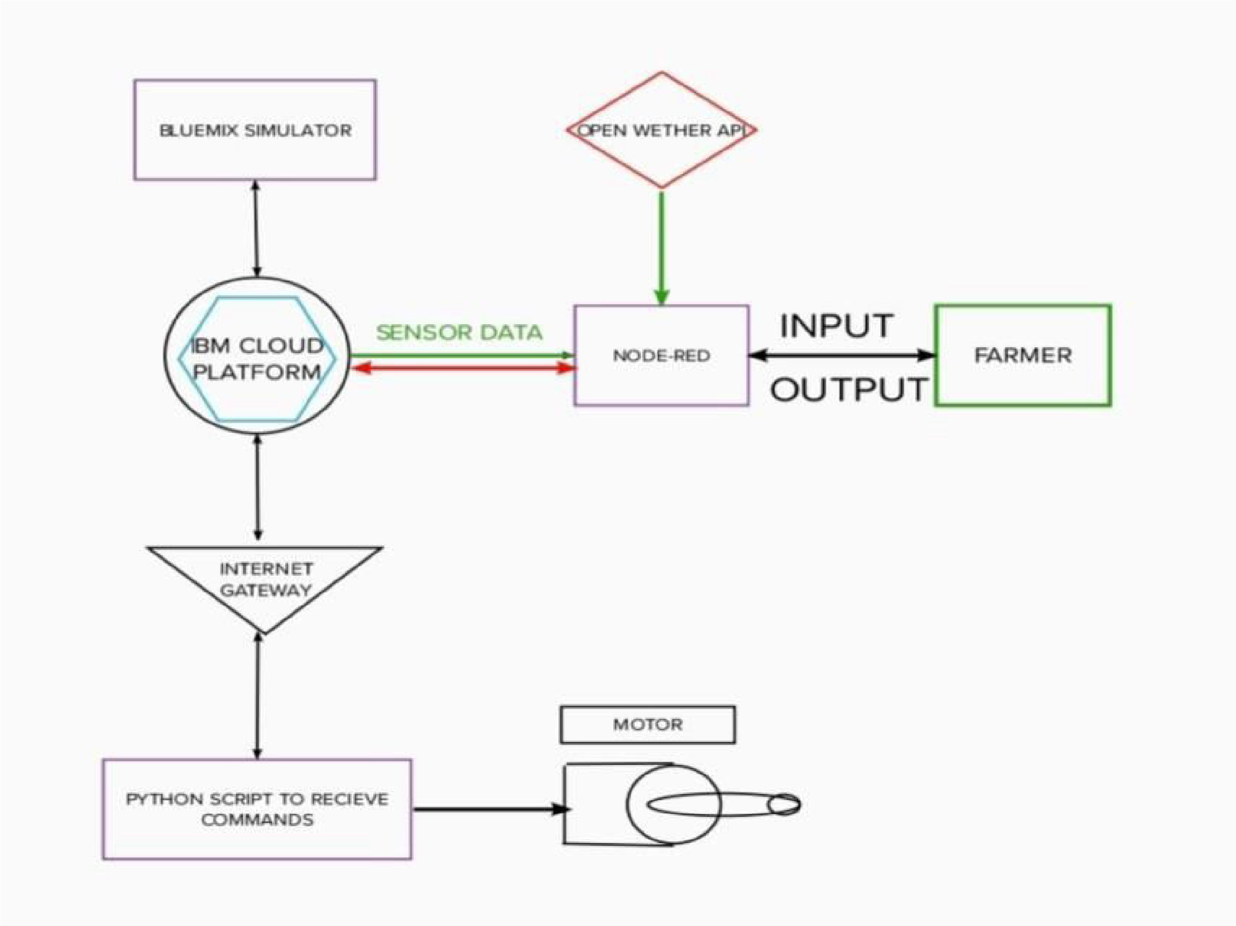
4.2 Non-Functional Requirements

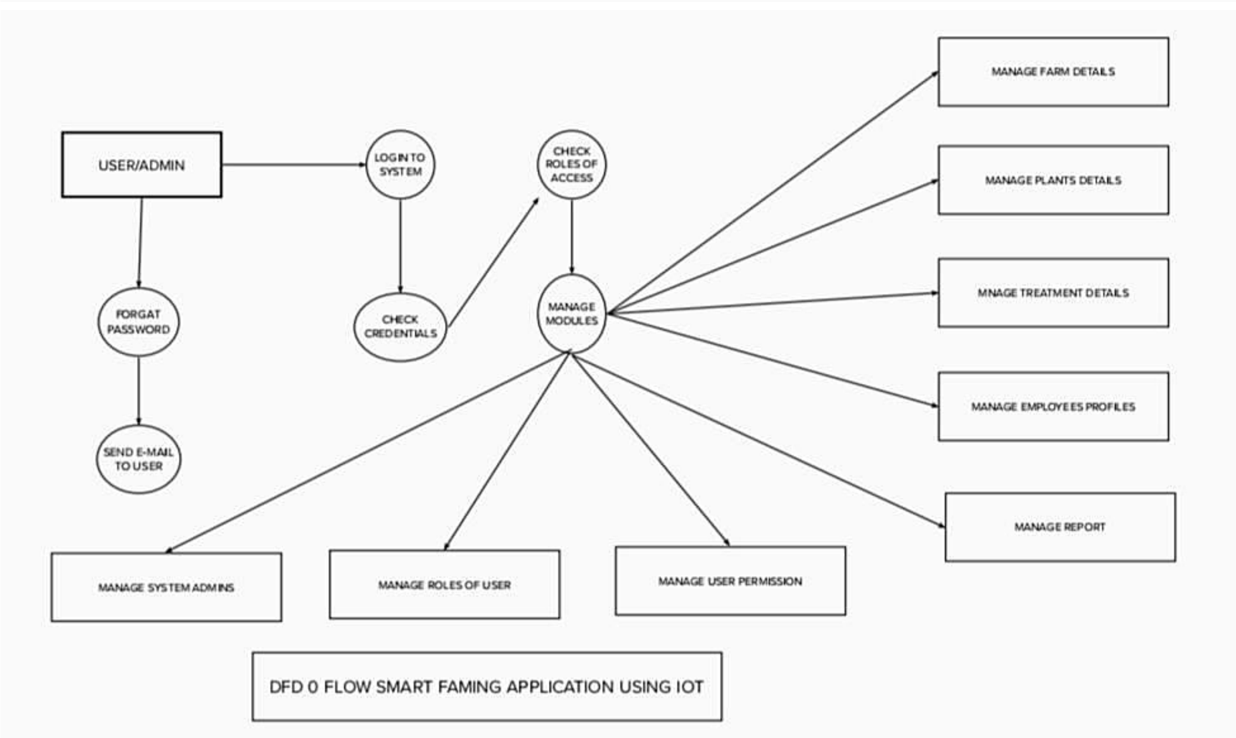
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	End users can monitor and control their connected farm using IOT applications on their smartphones or tablets.
NFR-2	Security	The software keeps the user's information more securely.
NFR-3	Reliability	The smart farm, embedded with IOT systems, could be called a connected farm, which can support a wide range of devices from diverse agricultural device manufactures.
NFR-4	Performance	It is a user-friendly software and have high performance.
NFR-5	Availability	Available for every user, visible for all users and farmer.
NFR-6	Scalability	The proposed precision farming structure allows the implementation of a flexible methodology that can be adopted to different types of crops.

5. Project Design

5.1 Data Flow Diagram

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.


BLUEMIX SIMULATOR
OPEN WETHER API
IBM CLOUD PLATFORM
SENSOR DATA
NODE-RED
INPUT
OUTPUT
FARMER
INTERNET GATEWAY
MOTOR
PYTHON SCRIPT TO RECIEVE COMMANDS


USER/ADMIN
LOGIN TO SYSTEM
CHECK ROLES OF ACCESS
FORGAT PASSWORD
CHECK CREDENTIALS
MANAGE MODULES
SEND E-MAIL TO USER
MANAGE FARM DETAILS
MANAGE PLANTS DETAILS
MNAGE TREATMENT DETAILS
MANAGE EMPLOYEES PROFILES
MANAGE REPORT
MANAGE SYSTEM ADMINS
MANAGE ROLES OF USER
MANAGE USER PERMISSION
DFD 0 FLOW SMART FAMING APPLICATION USING IOT

5.2 Solution Architecture

SENSORS

The soil moisture sensor senses the moisture level in the soil. The humidity and temperature sensor gives the humidity and temperature values of the atmosphere which determine whether the crop is suitable for growth. The soil moisture sensor, humidity and temperature sensor continuously monitors the soil and environmental conditions, sends the live data to mobile.

ARDUINO UNO

Arduino Uno is the heart of the system. The facts gathered with the aid of the sensors are sent to the Arduino UNO. The gathered information may be displayed in a Arduino IDE.

SOIL MOISTURE SENSOR

A soil moisture sensor empowers agriculturalists to estimate the water levels without the need to be physically present in the field.

HUMIDITY SENSOR

Humidity sensors are electronic devices that measure and report the moisture and air temperature of the surrounding environment.

- The different soil parameters (temperature, humidity, Soil Moisture) are sensedusing different sensors, and the obtained value is stored in the IBM cloud.
- Arduino UNO is used as a processing unit that processes the data obtained from sensors and weather data from weather API.
- Node-red is used as a programming tool to wire the hardware, software, and APIs. The MQTT protocol is followed for communication.
- All the collected data are provided to the user through a mobile application that wasdeveloped using the MIT app inventor. The user could make a decision through an app, whether to water the crop or not depending upon the sensor values. By using the app they can remotely operate the motor switch.

5.3 User Stories

User Type	Functional Requirement	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
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation on email & click confirm	High	Sprint-1
Customer (Web user)		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
Customer Care Executive		USN-4	As a user, I can register for the application through Gmail		Medium	Sprint-1
Administra	Login	USN-5	As a user, I can		High	Sprint-1

tor			log into the application by entering email & password			

6.Project Planning & Scheduling

6.1 Sprint Planning & Estimation

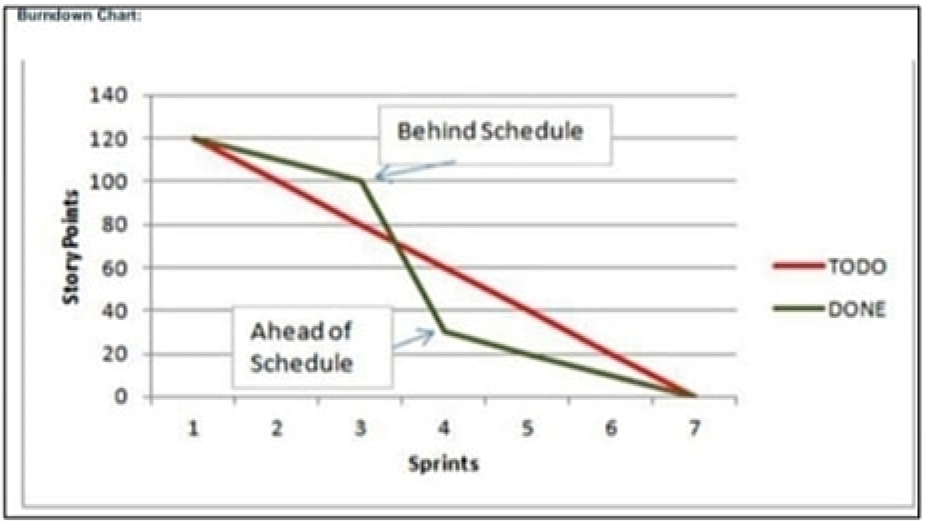
Sprint	Functional Requirement (Epic)	User Story Number	User Story /Task	Story Points	Priority	Team Member
Sprint-1	Registration (Farmer Mobile User)	UNS-1	As a user, I can register for the application by entering my email, password, and confirming my password.	**2**	High	Surendhar S (Team Leader)
Sprint-1	Login	UNS-2	As a user, I will receive confirmation email once I have registered for the application	**1**	High	Vasanth M (Member 3)
Sprint-2	User Interface	UNS-3	As a user, I can register for the application through Facebook	**3**	Low	Surendhar S (Team Leader)
Sprint-1	Data Visualization	UNS-4	As a user, I can register for the application through GMAIL	**2**	Medium	Yuvarajan S(Member 2)
Sprint-3	Registration (Farmer -Web User)	UNS-1	As a user, I can log into the application by entering email and	**3**	High	(Member 4) A Thamimulansari

			password			
Sprint-2	Login	UNS-2	As a registered user, I need to easily login log into my registered account via the web page in minimum time	**3**	High	Surendhar S (Team Leader)
Sprint-4	Web UI	UNS-3	As a user, I need to have a friendly user interface to easily view and access the resources	**3**	Medium	Vasanth M (Member 3)
Sprint-1	Registration (Farmer -Web User)	UNS-1	As a new user, I want to first register using my organization email and create a password for the account.	**2**	High	(Member 4) A Thamimulansari
Sprint-4	Login	UNS-2	As a registered user, I need to easily log in using the registered account via the web page.	**3**	High	Yuvarajan S(Member 2)

6.2 Sprint Delivery Schedule

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	12	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	6	6 Days	31 Oct 2022	05 Nov 2022	20	30 OCT 2022
Sprint-3	6	6 Days	07 Nov2022	12 Nov 2022	20	6 NOV 2022
Sprint-4	6	6 Days	14 Nov2022	19 Nov 2022	20	7 NOV 2022

6.3 JIRA Report



7.Coding & Solutioning

7.1 Feature - 1

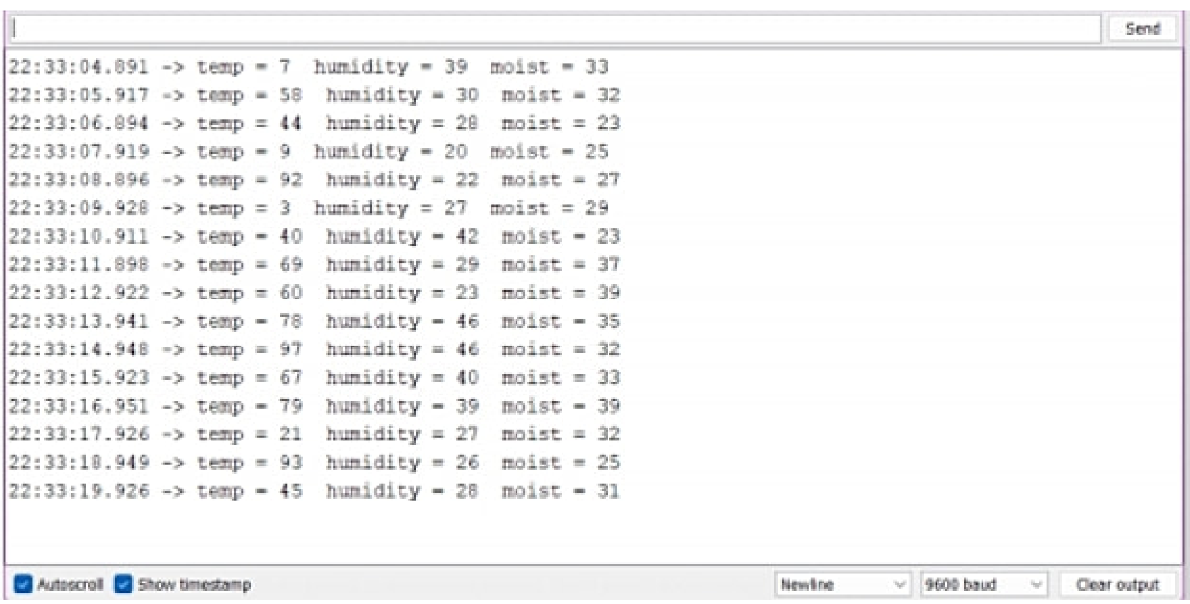
Receiving commands from IBM cloud using C++ program

```
#include "Arduino.h
" #include "dht.h"
 #include "SoilMoisture.h"
 #define dht_apin A0
 #define organization = "mmbh4c"
 #define deviceType = "smartfarmer"
 #define deviceId = "smartfarmer_1"
 #define authMethod = "use-token-auth"
 #define authToken = "123456789"
 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
 char publishTopic[] = "iot-2/evt/abcd_1/fmt/json"
;char topic[] = "iot2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth"
;char token[]=TOKEN;
 char clientId[] = "d:"
```

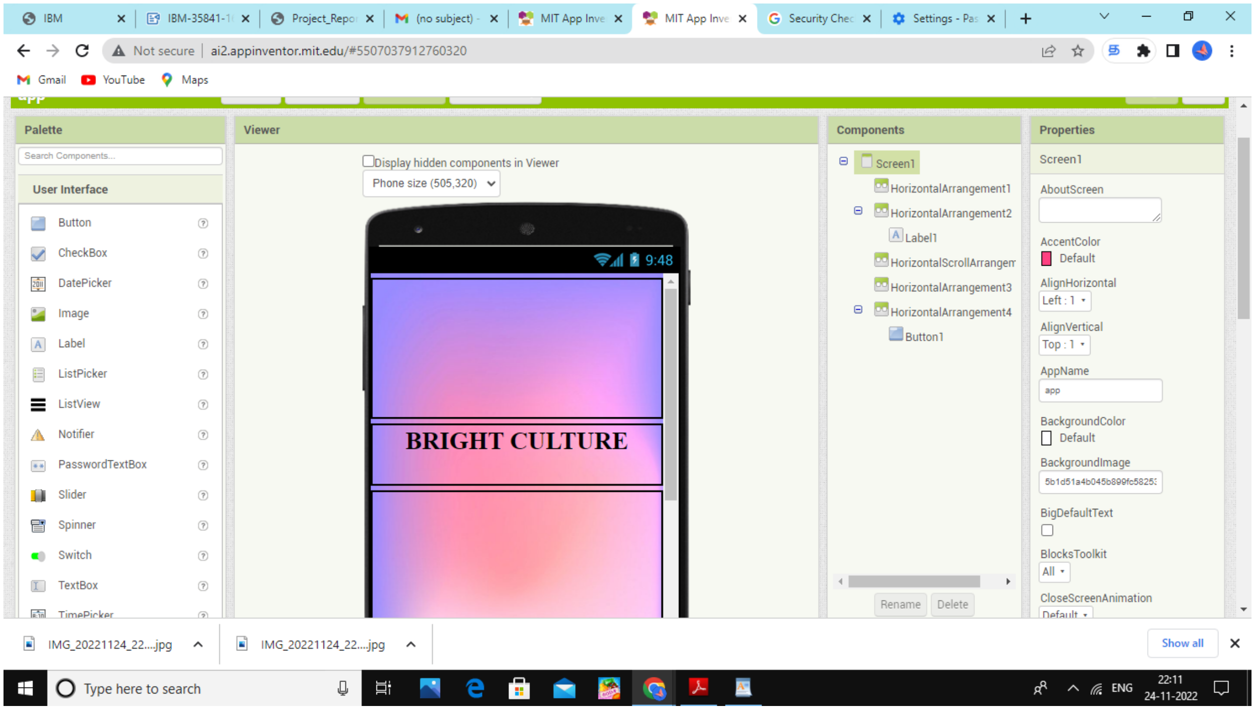
```
 ORG ":" DEVICE_TYPE ":"DEVICE_ID;
const int sensor_pin = A1; //soil moistureint pin_out = 9;
 dht DHT;
int c=0;
 void setup()
 {
pinMode(2, INPUT); //Pin 2 as INPUT pinMode(3, OUTPUT);

//PIN 3 as OUTPUT pinMode(9, OUTPUT)

;//output for pump } void loop()

{

if (digitalRead(2) == HIGH)
 {
 digitalWrite(3, HIGH);

 // turn the LED/Buzz ONdelay(10000);
 digitalWrite(3, LOW);

// turn the LED/Buzz OFFdelay(100);
 }
 Serial.begin(9600);

delay(1000); DHT.read11(dht_apin);

 //tempraturefloat h=DHT.humidity;
float t=DHT.temperature;delay(5000);
 Serial.begin(9600);

 float moisture_percentage;
int sensor_analog;
sensor_analog = analogRead(sensor_pin);
moisture_percentage = ( 100 - ( (sensor_analog/1023.00) *100 ) );
 float m=moisture_percentage;delay(1000);
 if(m<40)      //pump { while(m<40)

 {
 digitalWrite(pin_out,HIGH);       //open pump
```

```
 sensor_analog = analo
}
 digitalWrite(pin_out,LOW);     //closepump 29

 }
 if(c>=0)
 {
 mySerial.begin(9600);

delay(15000);
Serial.begin(9600);
dgRead(sensor_pin);
 moisture_percentage = ( 100 - ( (sensor_analog/1023.00) *100 ) );
 m=moisture_percentage;
delay(1000);
}

}
```

Output



7.2 Feature – 2



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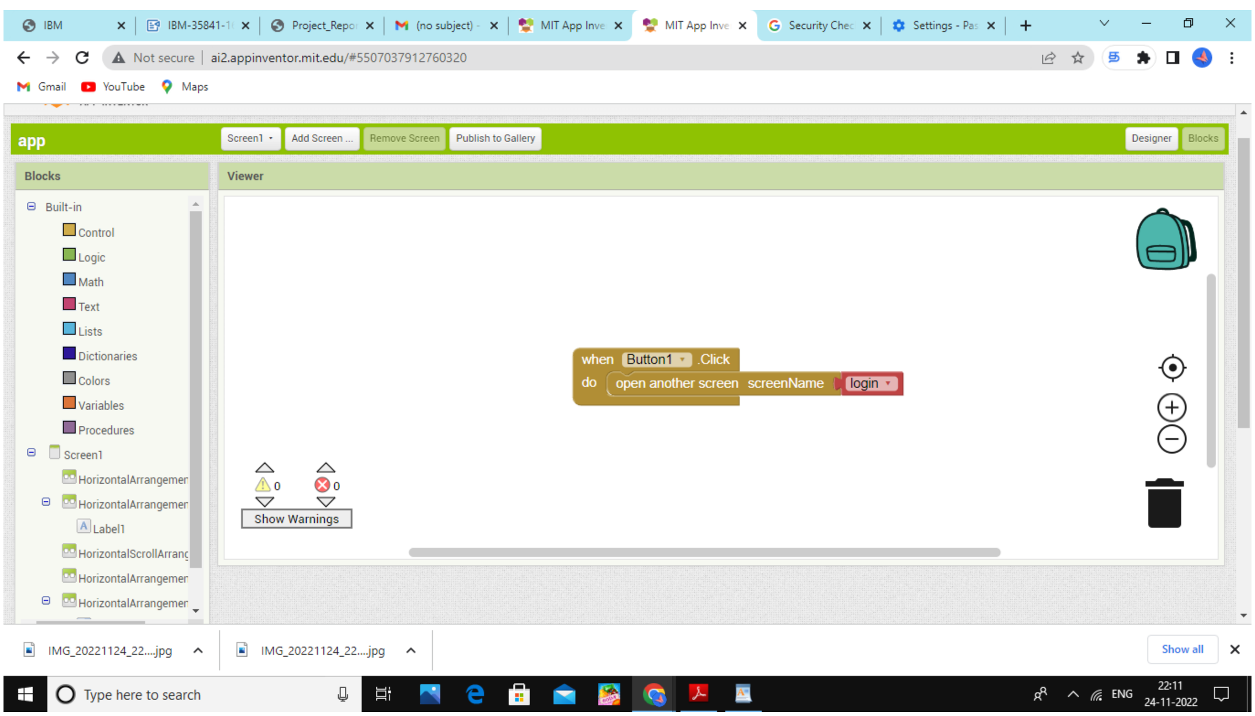
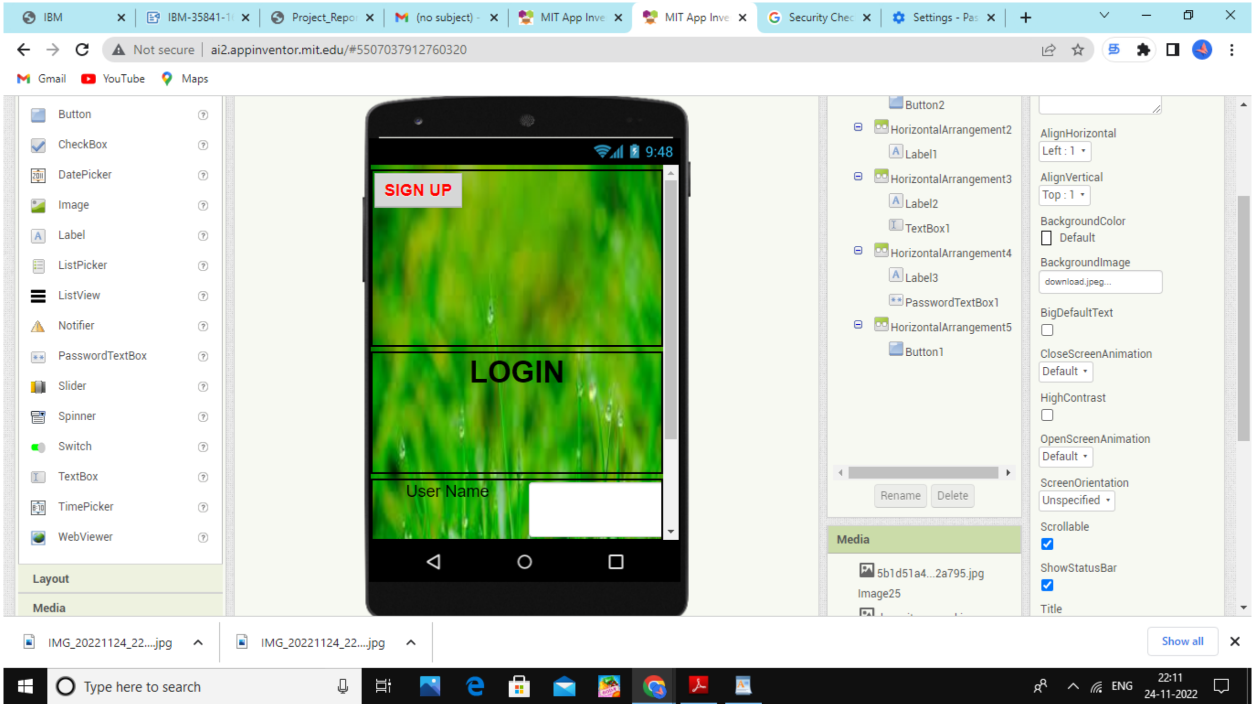
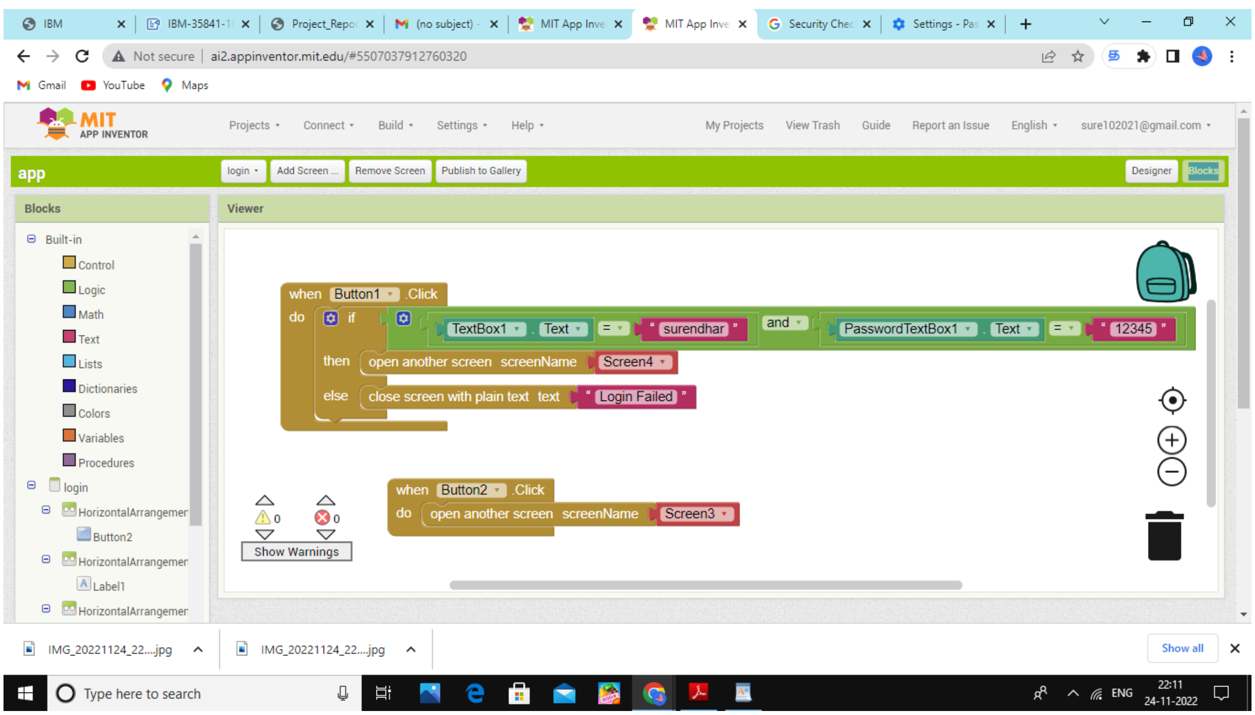
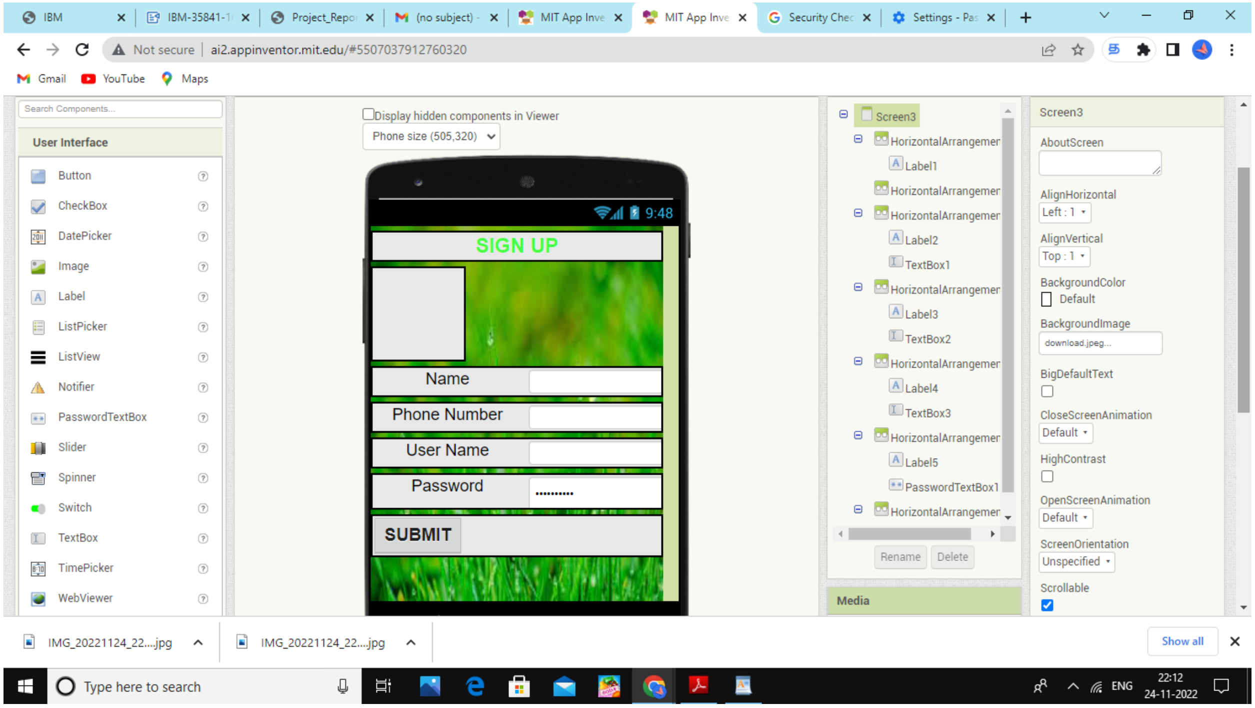
Palette
Viewer
Components
Properties
User Interface
Button
CheckBox
DatePicker
Image
Label
ListPicker
ListView
Notifier
PasswordTextBox
Slider
Spinner
Switch
TextBox
Display hidden components in Viewer
Phone size (505,320)
BRIGHT CULTURE
Screen1
HorizontalArrangement1
HorizontalArrangement2
Label1
HorizontalArrangement3
HorizontalArrangement4
Button1
Rename
Delete
AboutScreen
AccentColor
Default
AlignHorizontal
Left : 1
AlignVertical
Top : 1
AppName
app
BackgroundColor
BackgroundImage
BigDefaultText
BlocksToolkit
All
CloseScreenAnimation

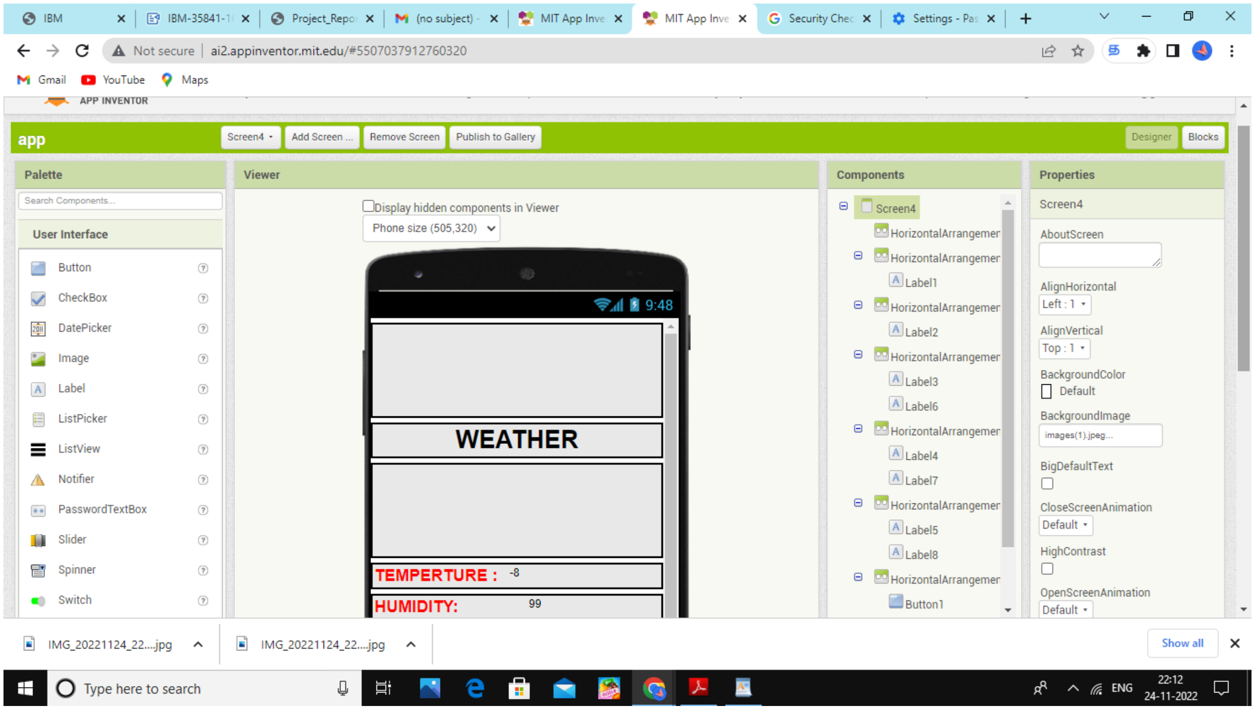


ai2.appinventor.mit.edu/#5507037912760320
app
Screen1
Add Screen ...
Remove Screen
Publish to Gallery
Designer
Blocks
Viewer
Built-in
Control
Logic
Math
Text
Lists
Dictionaries
Colors
Variables
Procedures
Screen1
Label1
when Button1 .Click
do open another screen screenName login
Show Warnings


SIGN UP
LOGIN
User Name

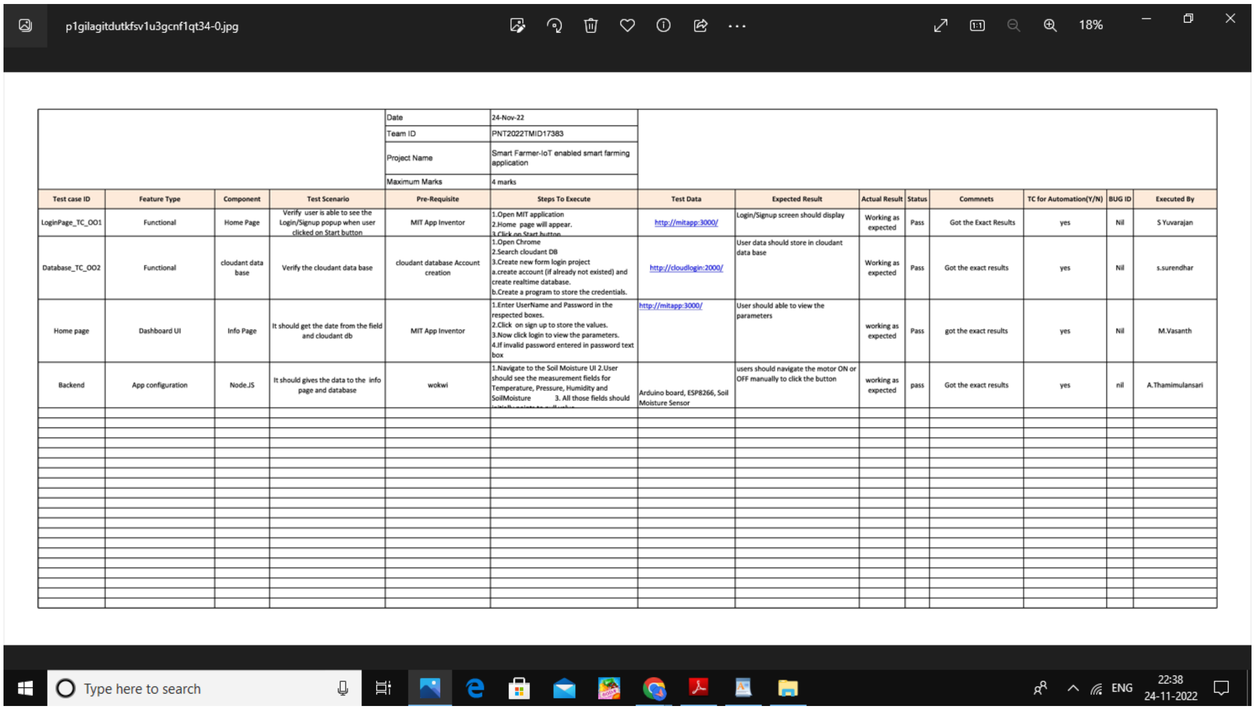

when Button1 .Click
do if TextBox1 . Text = " surendhar " and PasswordTextBox1 . Text = " 12345 "
then open another screen screenName Screen4
else close screen with plain text text " Login Failed "
when Button2 .Click
do open another screen screenName Screen3





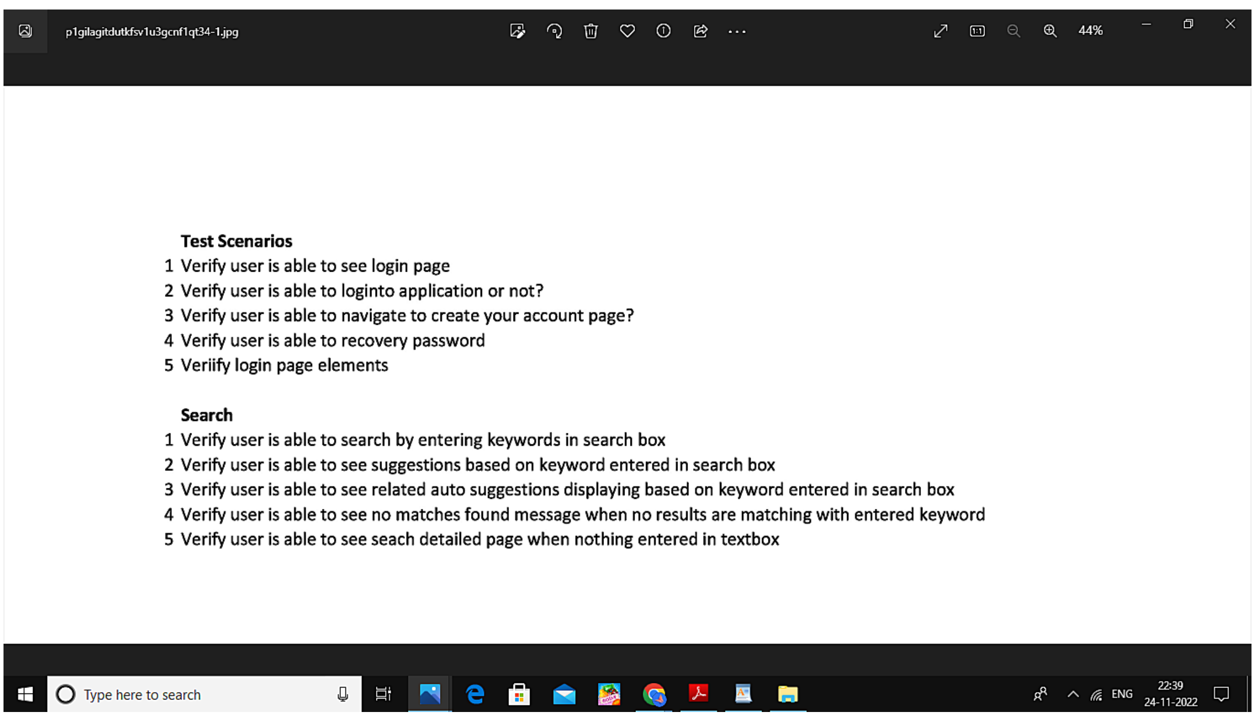
8.Testing

8.1Test Cases



Date	24-Nov-22
Team ID	PNT2022TMID17383
Project Name	Smart Farmer-IoT enabled smart farming application
Maximum Marks	4 marks

Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/N)	BUG ID	Executed By
LoginPage_TC_OO1	Functional	Home Page	Verify user is able to see the Login/Signup popup when user clicked on Start button	MIT App Inventor	1.Open MIT application 2.Home page will appear. 3.Click on Start button	http://mitapp:3000/	Login/Signup screen should display	Working as expected	Pass	Got the Exact Results	yes	Nil	S Yuvarajan
Database_TC_OO2	Functional	cloudant data base	Verify the cloudant data base	cloudant database Account creation	1.Open Chrome 2.Search cloudant DB 3.Create new form login project a.create account (if already not existed) and create realtime database. b.Create a program to store the credentials.	http://cloudlogin:2000/	User data should store in cloudant data base	Working as expected	Pass	Got the exact results	yes	Nil	s.surendhar
Home page	Dashboard UI	Info Page	It should get the date from the field and cloudant db	MIT App Inventor	1.Enter UserName and Password in the respected boxes. 2.Click on sign up to store the values. 3.Now click login to view the parameters. 4.If invalid password entered in password text box	http://mitapp:3000/	User should able to view the parameters	working as expected	Pass	got the exact results	yes	Nil	M.Vasanth
Backend	App configuration	Node.JS	It should gives the data to the info page and database	wokwi	1.Navigate to the Soil Moisture UI 2.User should see the measurement fields for Temperature, Pressure, Humidity and SoilMoisture 3. All those fields should initially points to null value	Arduino board, ESP8266, Soil Moisture Sensor	users should navigate the motor ON or OFF manually to click the button	working as expected	pass	Got the exact results	yes	nil	A.Thamimulansari



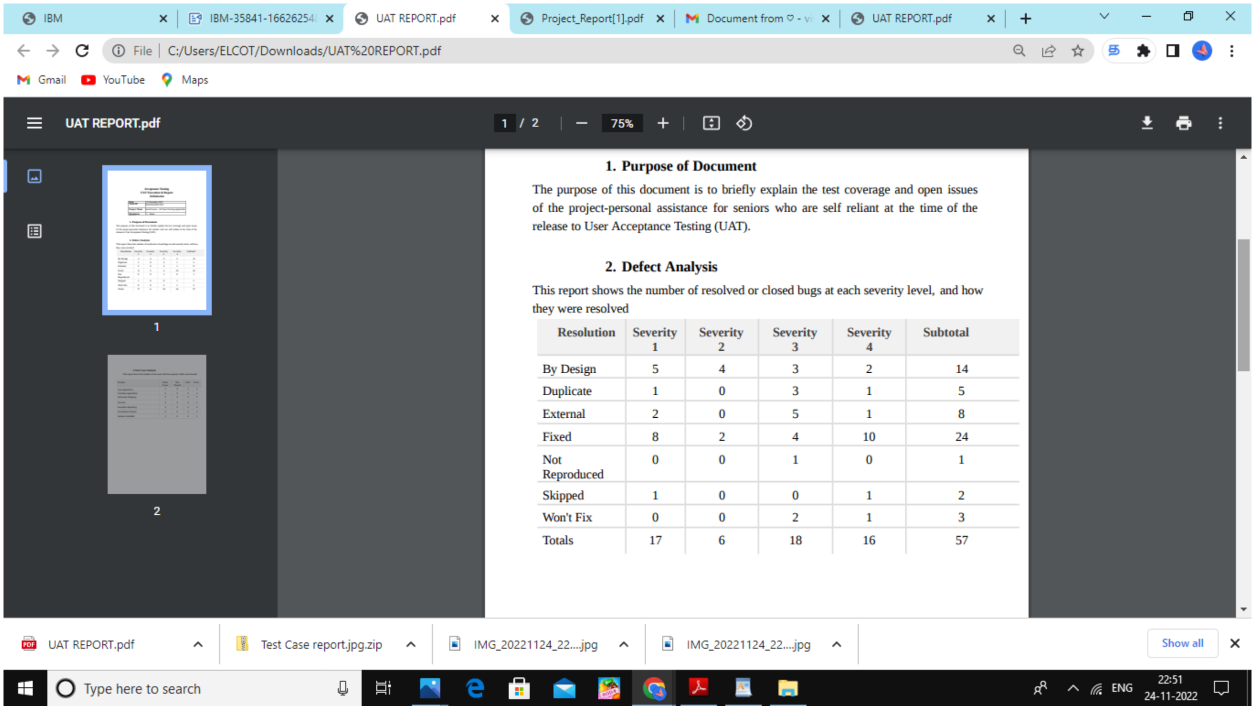
Test Scenarios

1 Verify user is able to see login page
2 Verify user is able to loginto application or not?
3 Verify user is able to navigate to create your account page?
4 Verify user is able to recovery password
5 Veriify login page elements

Search

1 Verify user is able to search by entering keywords in search box
2 Verify user is able to see suggestions based on keyword entered in search box
3 Verify user is able to see related auto suggestions displaying based on keyword entered in search box
4 Verify user is able to see no matches found message when no results are matching with entered keyword
5 Verify user is able to see seach detailed page when nothing entered in textbox

8.2 User Acceptance Testing



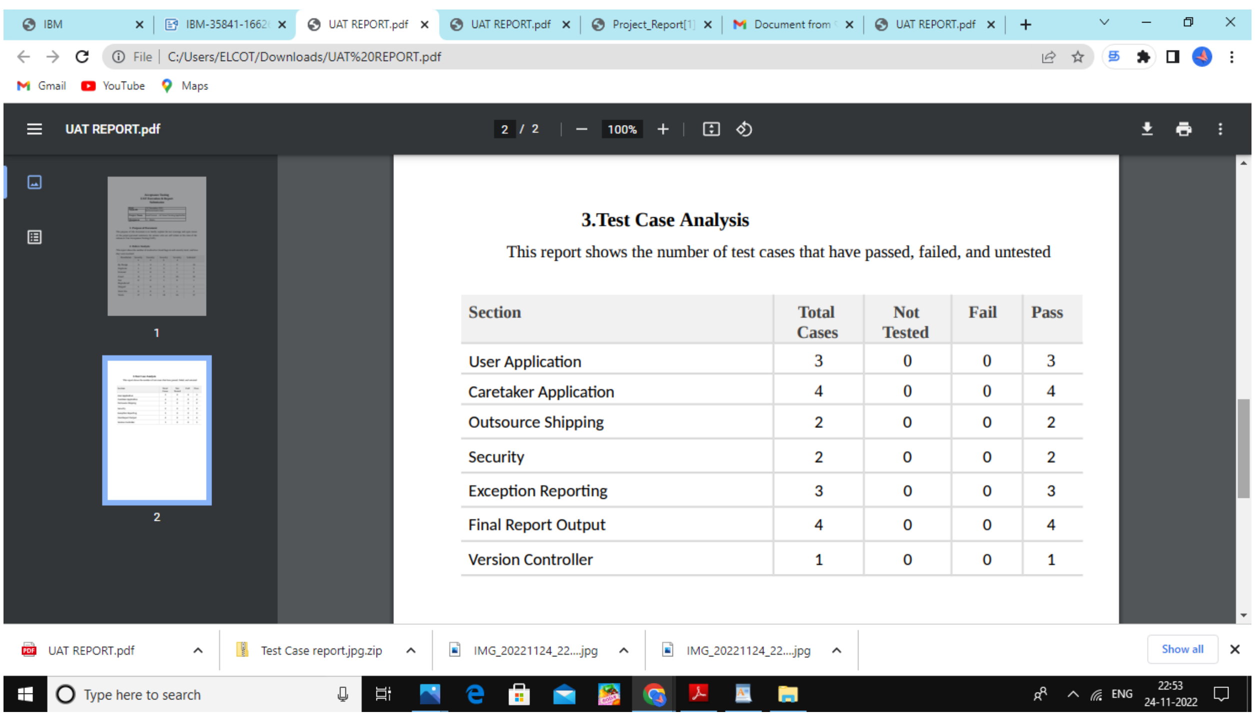
1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the project-personal assistance for seniors who are self reliant at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	5	4	3	2	14
Duplicate	1	0	3	1	5
External	2	0	5	1	8
Fixed	8	2	4	10	24
Not Reproduced	0	0	1	0	1
Skipped	1	0	0	1	2
Won't Fix	0	0	2	1	3
Totals	17	6	18	16	57



3.Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
User Application	3	0	0	3
Caretaker Application	4	0	0	4
Outsource Shipping	2	0	0	2
Security	2	0	0	2
Exception Reporting	3	0	0	3
Final Report Output	4	0	0	4
Version Controller	1	0	0	1

9.Result

9.1 Performance Matrices

DATE: 23 NOVEMBER 2022 **TEAM ID : PNT2022TMID17383**

NFT RISK ASSESSMENT

SNO	Project Name	Scope/Feature	Functional Changes	Hardware Changes	Software Changes	Impact of downtime	Load/Volume Changes	Risk Score	Justification
1	smart farming - IoT Enabled Smart Farming application	New	Low	Moderate	Moderate	Low	>15 to 30%	RED	No changes seen

NFT DETAILED TEST PLAN

S.NO	Project overview	NFT Test Approach	Assumptions/Dependencies/Risk	Approval/SignOff
1	Smart farming	Stress	App crash/ Developer Team/SiteDown	Approved
2	Smart farming	Load	Server crash/ Developer Team/Server Down	Approved

S.no	Project overview	NFT Test Approach	NFR MET	Test outcome	GO/NO-GO Decision	Recommendations	Identified Defects (Detected/Closed/Opened)	Approval/SignOff
1	Smart farming	Stress	Performance	CPU-01	GO	High Performance	closed	Approved
2	Smart farming	Load	Stability	Dtabase Storage-01	NO-GO	One MongoDB instance for free	closed	Approved

10. Advantages & Disadvantages

Advantages:

- Farms can be monitored and controlled remotely.
- Increase in convenience to farmers.
- Less labor cost.
- Better standards of living.

Disadvantages:

• Lack of internet/connectivity issues.

• Added cost of internet and internet gateway infrastructure

. • Farmers wanted to adapt the use of WebApp

11. Conclusion

An IoT-based SMART FARMING SYSTEM for live monitoring of temperature,humidity and soil moisture is proposed using Arduino and cloud computing. The system has high efficiency and accuracy in acquiring live temperature and soil moisture data. The IoT-based smart farming system proposed in this report constantly assists farmers by providing accurate live feeds of ambient temperature and soil moisture for over 99 curated results, thus enabling farmers to increase their agricultural yields and help manage food production efficiently

12. Future Scope

By collecting data from Sensor with IoT devices, we can learn

about the “real state” of Crops. In future, IoT system in agriculture enables predictive analytics and helps you make better harvest decisions. It is important to use the latest information and communication technology to manage the family in order to improve the quantity and quality of products while optimizing the human labor force. In between Technologies available for today's glory: Soil, water, light, humidity and temperature control. Small Agricultural Products are designed to support field monitoring through the automation of automation systems using Sensors. As a result, Fame and associated volumes can easily monitor field conditions from anywhere.

13. Appendix

Github link

https://github.com/IBM-EPBL/IBM-Project-35841-1660289178

Demo Link

https://drive.google.com/file/d/1qQUSCXuZvNurNJAdJ5TcpehJ7QKobzMG/view?usp=drivesdk