

Jamia Millia Islamia Univesity
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Presentation on
Iot based Platform For smart Agriculture system
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ABSTRACT

- ▮ Agriculture plays vital role in the development of economy in the country. In India about 70% of population depends upon farming.
- ▮ One of the solution to this problem is smart agriculture by modernizing the current traditional methods of agriculture.
- ▮ The highlighting features of this project includes smart control and intelligent decision making based on accurate real time field data.

INTRODUCTION

Agriculture is considered as the basis of life for the human species as it is the main source of food grains and other raw materials.

- It plays vital role in the growth of country's economy. It also provides large ample employment opportunities to the people.

- Growth in agricultural sector is necessary for the development of economic condition of the country.

- Unfortunately, many farmers still use the traditional methods of farming which results in low yielding of crops and fruits.

- But wherever automation had been implemented and human beings had been replaced by automatic machineries, the yield has been improved.

Hence there is need to implement modern science and technology in the agriculture sector for increasing the yield.

What is smart Farming lot

Internet of things includes enhanced objects with technology in processing, sensors and more that can send and receiving data to other networks.

There have been examples of iot in daily activities like home automation to save energy, traffic control etc .!!

The integration between technology and farmers skills is aimed to produce the best quality and quantity of the commodity.

Humans used to take all the roles in farming from planting, growing, harvesting, checking, and so

OBJECTIVES

- ☐ Reduce the man power and conserve the water .
- ☐ Continuously Monitoring the status of soil through sensor and provide signal for taking necessary action.
- ☐ To get the output of soil water sensor and provide water to crop.
- ☐ To observe the other parameters for better yield.
- ☐ Real time sensing and control.

EXISTING SYSTEM

- Everything in the farm is totally dependent on humans. In order to perform operations like ploughing fields, spraying seeds, fertilizers we do require humans.
- Also in order to check the level of water inside the farm humans are required. This is how every activity in a farm is totally dependent on human beings.
- As now we are using motors to turn ON the bore wells or wells in order to send the water to the farm and later we need to turn OFF the motor after checking the availability of water in the farm.
- All these activities truly indicate that humans are essential in a farm.

PROPOSED SYSTEM

- ▢ Step 1:- This is the Hardware Equipment of the project. First we initialize the kit by using a toggle switch.
- ▢ Step 2:- Dump the code in the **Arduino Uno** module by using the USB port
- ▢ Step 3:-make a call to activate the SIM in the circuit board from the number in which the text message should receive
- ▢ Step 4:-keep the sensor in a open area to see the room temperature and note the values
- ▢ Step 5:-keep the sensors in the soil for knowing moisture value of soil
- ▢ Step 6:-on the bases of temperature, humidity, moisture, values the motor ON or OFF

Smart Farming Techniques

- ❑ Technologies in farming have been utilized in numerous ways .Each kind is installed for a different purpose.
- ❑ Based on the functions, here are some technologies in using technology for smart farming.

1)-Field mapping or data collection

2)-Predictive analytics

3)-Data saving

4)-Tacking and monitoring

5)-labor Work

6)-Warehousing

7)-Saving energy

Field mapping or data collection

- Sensor technology is set up to measure environmental aspects such as humidity, temperature, light intensity, wind water/rainfall, soil composition, and more.
- Then GPS and GIS support the bigger picture of the map by providing the geospatial data

Predictive analytics

- Based on the required from field mapping several types of analytic software can predict and suggest the needed actions. Some even are equipped with alert systems of discrepancies or pest attacks.
- **DATA Saving**
- Using cloud based the regularly obtained data are uploaded as a record for future decision making. they are also shareable for wider area Analytics.
- **Tracking and Monitoring**
- This technique might require cameras , drones, tags and gps. Drones and cameras provide a visual of the field. Then tags and gps supply precise coordinate location of livestock.

Labour work

- Similar to automation, drones, and robotics are helpful to do labour work such as Planting seeds, watering the plant, harvesting, spraying the pesticides, milking the cows, picking fruits, irrigating and more.

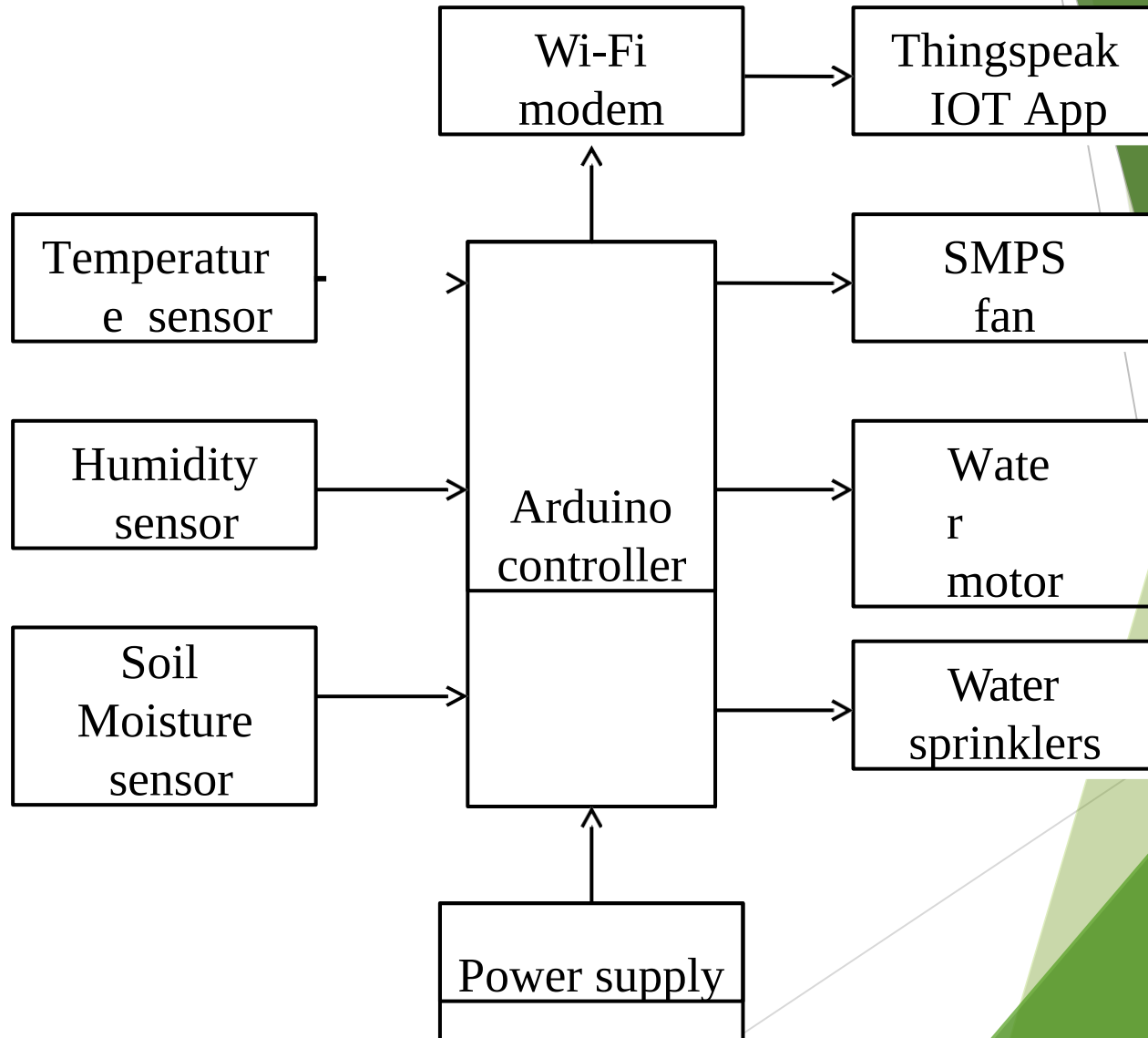
Warehousing

In tropical areas like India, farmers are utilising solar powered refrigerator to store the fruits and vegetables right on the farm. Storing them in fridges directly is a smart way to provide fresh commodities.

Saving Energy

Also, using automation, a system could be built in the farm to cut down energy consumption. Smart irrigation could automatically turn the machine off when a sufficient amount of water in the soil is reached. Drone spraying only on the necessary spots could prevent polluting the land.

BLOCK DIAGRAM



HARDWARE IMPLEMENTATION

ARDUINO

- Open source electronic platform.
- Easy to use
- Inexpensive.
- Cross-platform.
- Flexible.
- 16MHZ clock.
- 32Kb flash memory.
- 14 digital pins and 6 analog



Arduino Uno

- The Arduino board is the most used board of all components. The board contains 14 digital input/output pins in which 6 are analog input pins, one power jack, USB connector, reset button and other components.
- An Arduino-based mostly agriculture observance and controlling system is designed. DHT11 sensor, soil moisture sensor, LDR sensor and pH sensor are the main sensors utilized in this project that provide the exact value of temperature, humidity, wetness content, intensity level, and soil pH severally.

GSM MODULE

- Supply voltage: 3.8V - 4.2V
- Recommended supply voltage: 4V
- Power consumption:
 - sleep mode < 2.0mA
 - idle mode < 7.0mA
 - GSM transmission (avg): 350 mA
 - GSM transmission (peek): 2000mA
- Module size: 25 x 23 mm
- Interface: UART (max. 2.8V) and AT commands
- SIM card socket: microSIM (bottom side)
- Supported frequencies: Quad Band (850 / 950 / 1800 / 1900 MHz)
- Antenna connector: IPX
- Status signaling: LED
- Working temperature range: -40 do + 85 ° C



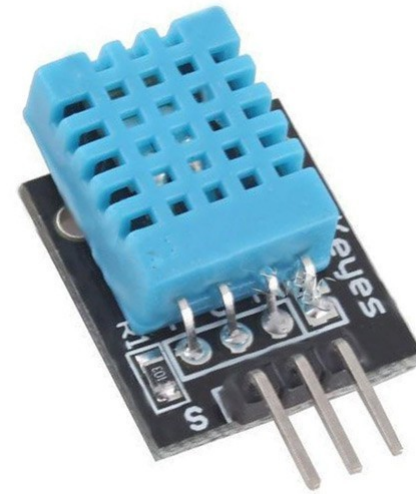
WATER SENSOR

- Working voltage: 5V
- Working Current: <20ma
- Working Temperature:
10°C~30°C
- Low power consumption
- Output voltage signal: 0~4.2V



DHT 11 SENSOR

- ❑ Operating Voltage: 3.5V to 5.5V
- ❑ Operating current: 0.3mA (measuring)
60uA (standby)
- ❑ Output: Serial data
- ❑ Temperature Range: 0°C to 50°C
- ❑ Humidity Range: 20% to 90%
- ❑ Resolution: Temperature and Humidity
both are 16-bit
- ❑ Accuracy: $\pm 1^\circ\text{C}$ and $\pm 1\%$



DHT11 SENSOR

- The pins on the sensor are OUT, for signal, the one in the -ve , +ve sign are for input.
- The OUT pin goes to digital pin 2 on the Arduino.
- The middle pin goes to 5V, and the minus sign goes to GND.

WATER SENSOR



- Connect the $+V_s$ to +5v on your Arduino board.
- Connect S to digital pin number 8 on Arduino board.
- Connect GND with GND on Arduino.

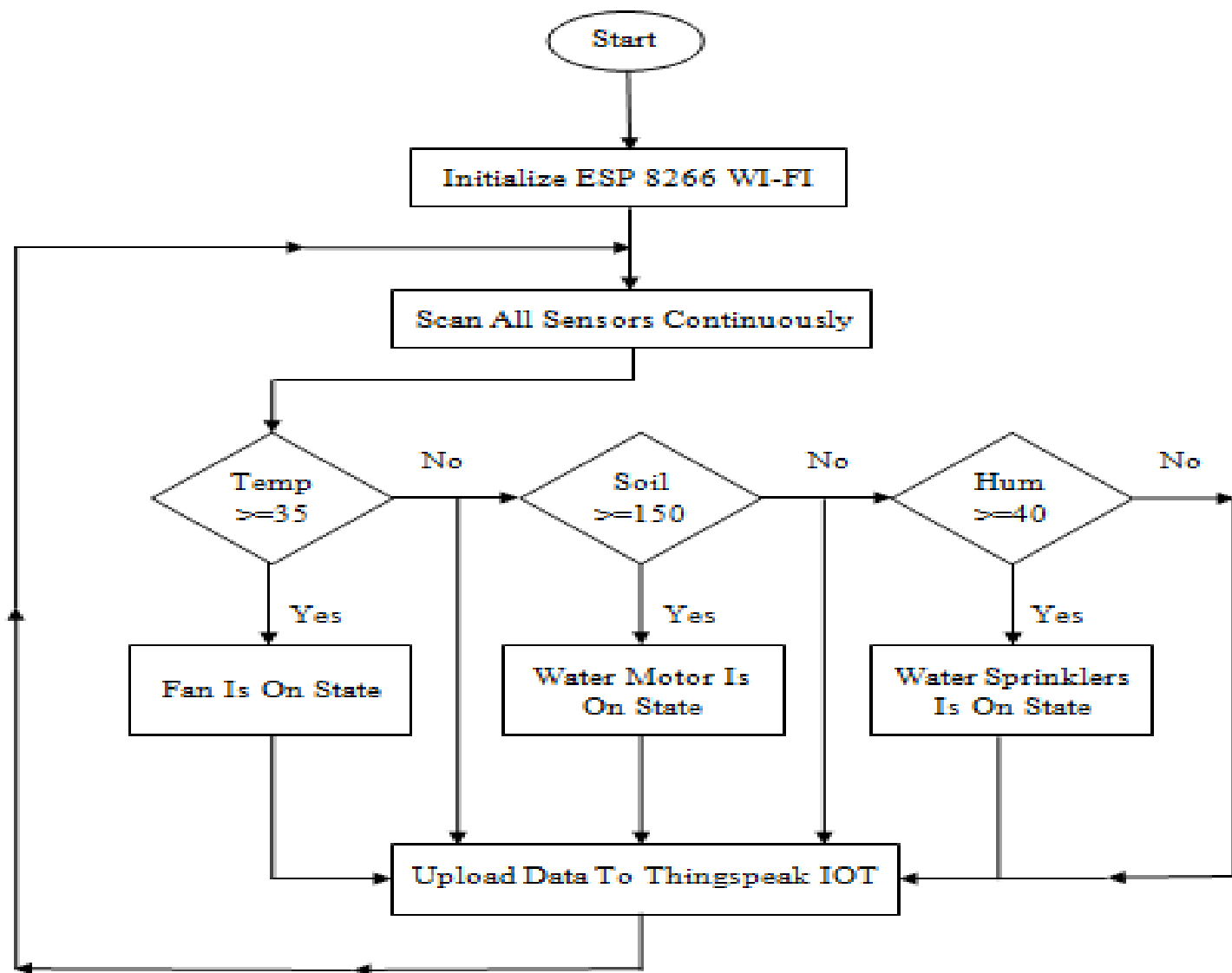
SOFTWARE

- ▮ Arduino IDE is an open-source software program that allows users to write and upload code within a real-time work environment.
- ▮ As this code will thereafter be stored within the cloud or , it is often utilized by those who have been searching for an extra level of redundancy.
- ▮ The system is fully compatible with any Arduino software board.
- ▮ Enhanced and intuitive tools provide users with access to advanced coding applications.

Sample Code

```
gsm.println("AT+CMGF=1")  
; delay(1500);  
gsm.println("AT+CMGS=\"9951529818\\r\"");  
    delay(1500);  
gsm.println("HUMIDITY CLIMATE IS HIGH TAKE  
ALERT..!");  
delay(1500);  
    gsm.println((char)26);// ASCII code of CTRL+Z  
    delay(1500);
```

FLOW CHART



FUTURE PROSPECT

- ▮ By using remote control humanoid with GPS system here it will be much useful for farmers where they can perform different tasks like plucking weeds and also for spraying pest controllers.
- ▮ It can also be used to protect the field from bird and animals scaring by keeping vigilance etc.

References

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- **O.Elijah,T.A Rahman,I.orikumhi, c.Y.leow,and M.N.Hindia “An overview of internet of things and data and analytics in agriculture Benefits and challenges” IEEE Internet of things journal, vol.5,no.5,pp.3758-3773,Oct 2018**

**THANK
YOU**