SMART IRRIGATION

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MCA S4

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CONTENTS

INTRODUCTION

- Water irrigation system based on Internet of Things (IoT).
- Irrigate the farmland in an efficient manner with automated irrigation System based on soil moisture.
- Operates by monitoring the value on soil moisture sensor and based on the reading, motor is kept ON or OFF.
- Node MCU transports the data to the digital platform of the server for processing of the data. Then those data are sent to the mobile application of the user.
- User-friendly experience with the help of mobile application.

LITERATURE REVIEW

YEAR	NAME OF THE PAPER	AUTHOR	DESCRIPTION	LIMITATIONS
2019	*Automatic Plant Watering System*	M. Mayuree P. Aishwarya A. Bagubali	User will be notified to switch ON/OFF the motor	User should be alert every time to OFF the motor.
2020	*Water irrigation using IoT*	J. Karpagam I. I. Merlin P. Bavithra J. Kousalya	Pump get ON and OFF automatically	no customized settings, expensive
2021	*IoT Enabled Smart Farming and Irrigation System*	M. Rohith R. Sainivedhana N. Sabiyath Fatima	switch on the motor to water the plants automatically	user cannot interfere with the process

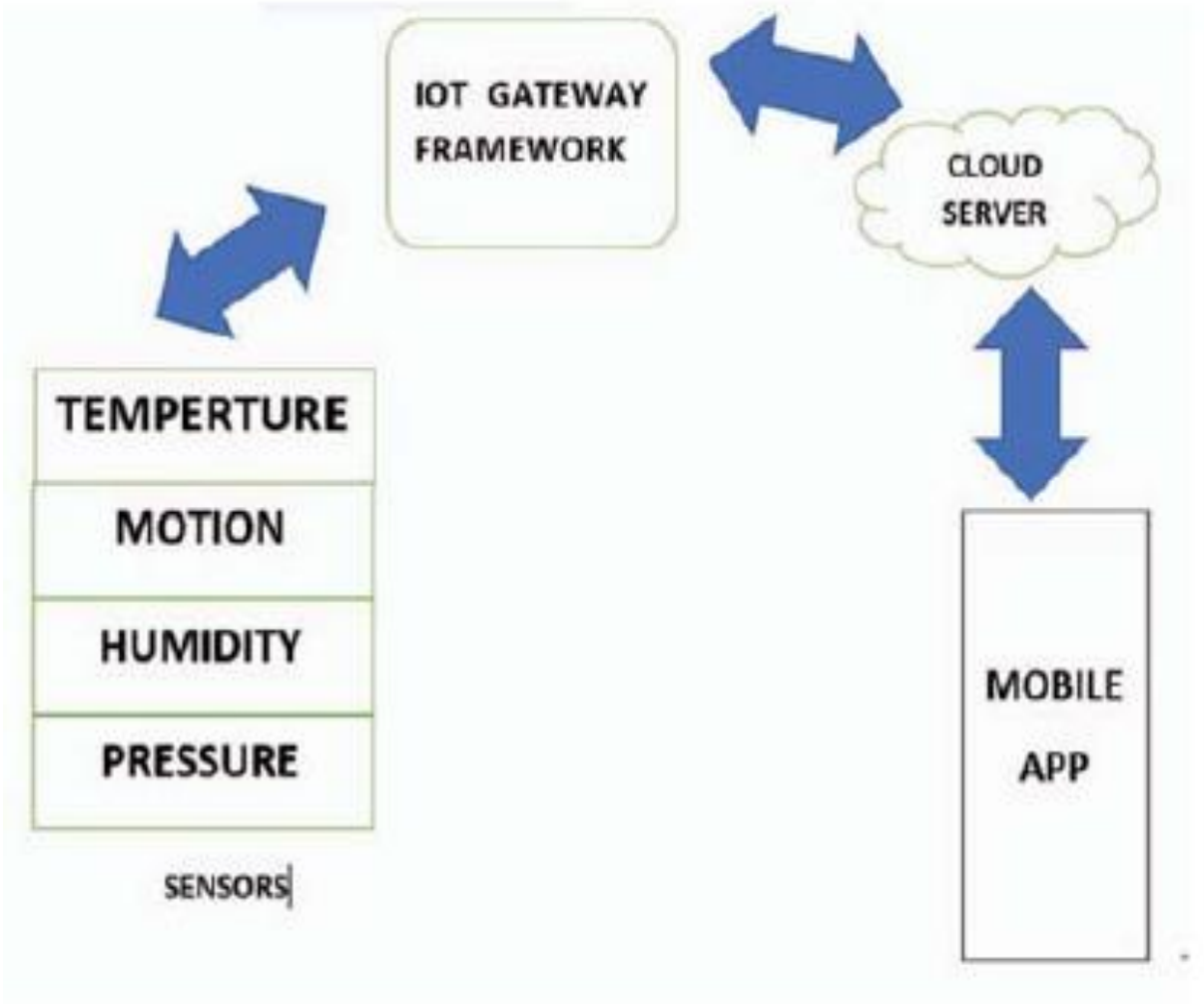
EXISTING SYSTEM

- In existing system, we require manual supervision and labour for proper irrigation.
- As per the paper *"An IoT Based Smart Irrigation System," 2021* , existing system consist of a motor that pumps water automatically based on the value of sensor.
- No user intervention
- Expensive
- No customized settings

PROPOSED SYSTEM

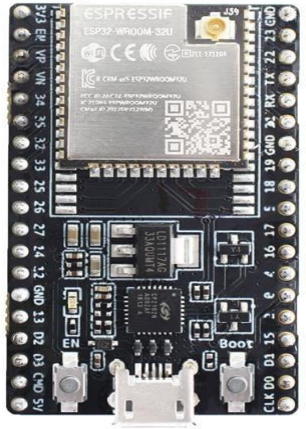
- In the proposed system, the watering process is automated which reduces manual work.
- Various parameters of the plant and soil such as temperature, humidity and moisture are sensed with the help of sensors and is displayed in the mobile application.
- When there is a decrease in any of these sensed values, it sends a signal to the user and the user can turn ON the motor by a simple click on mobile phone.

ARCHITECTURE

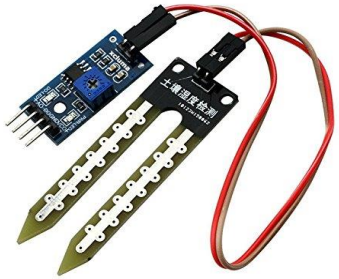


COMPONENTS

1. **ESP32**



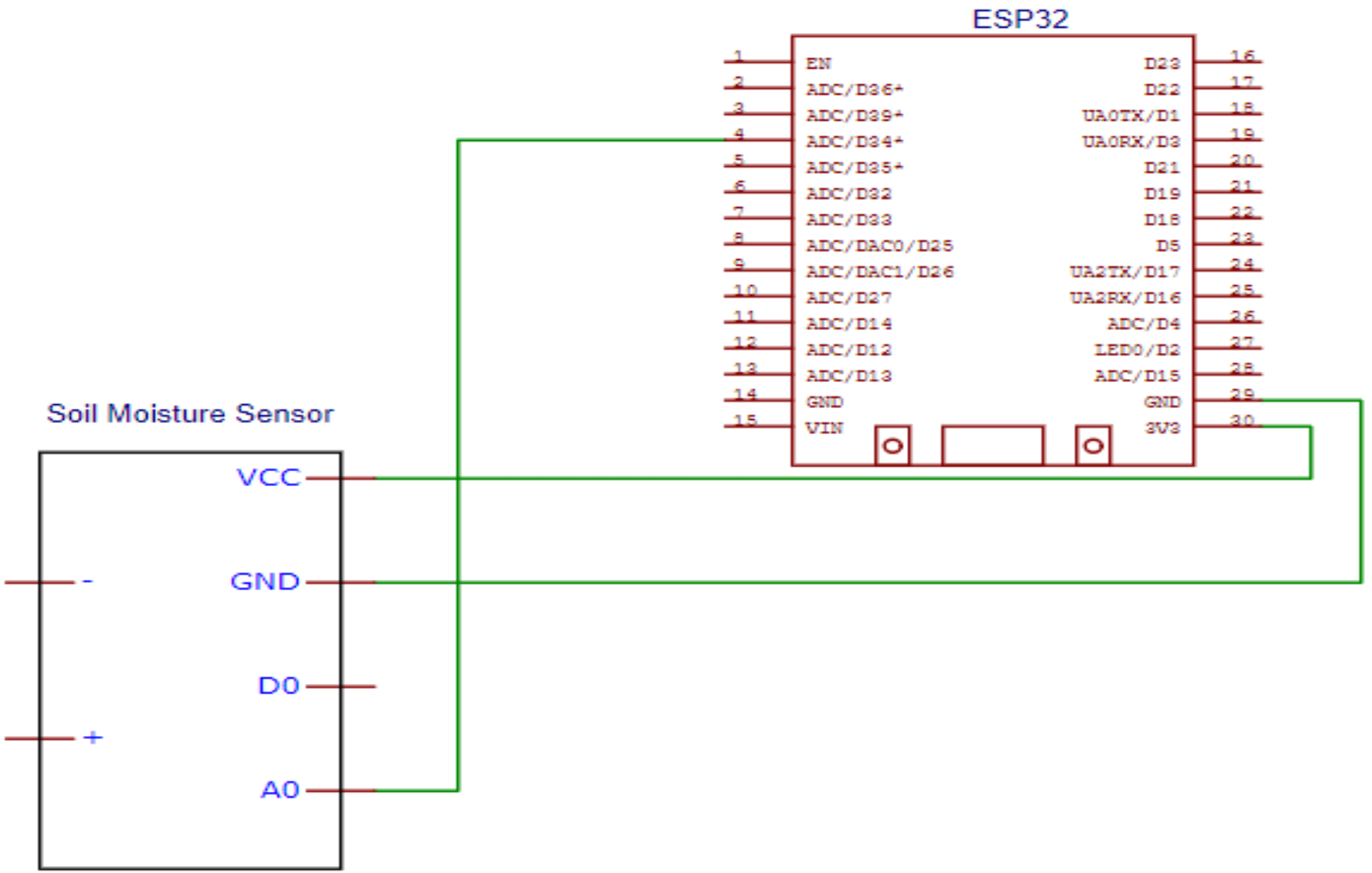
2. **Soil moisture sensor**

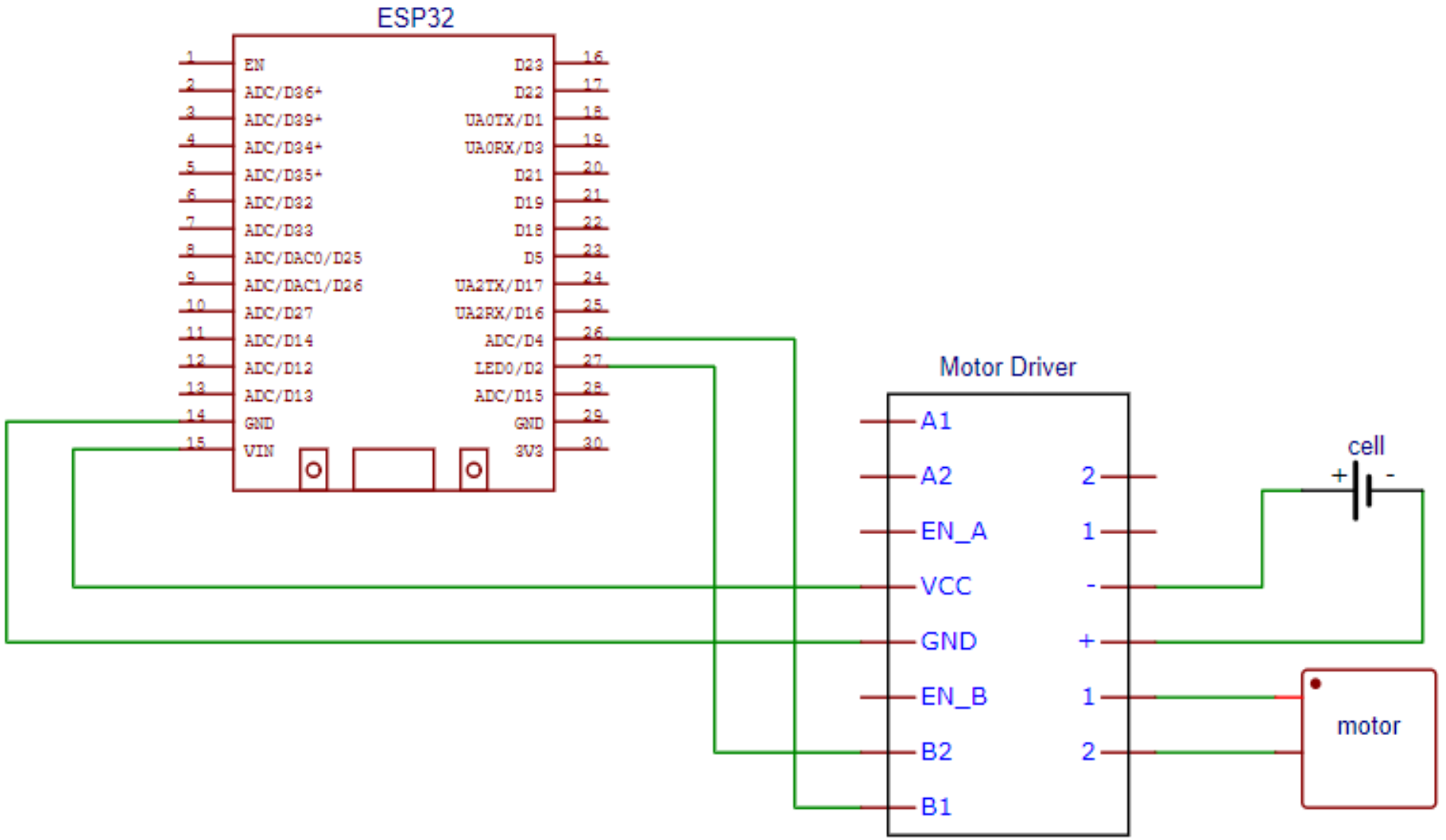


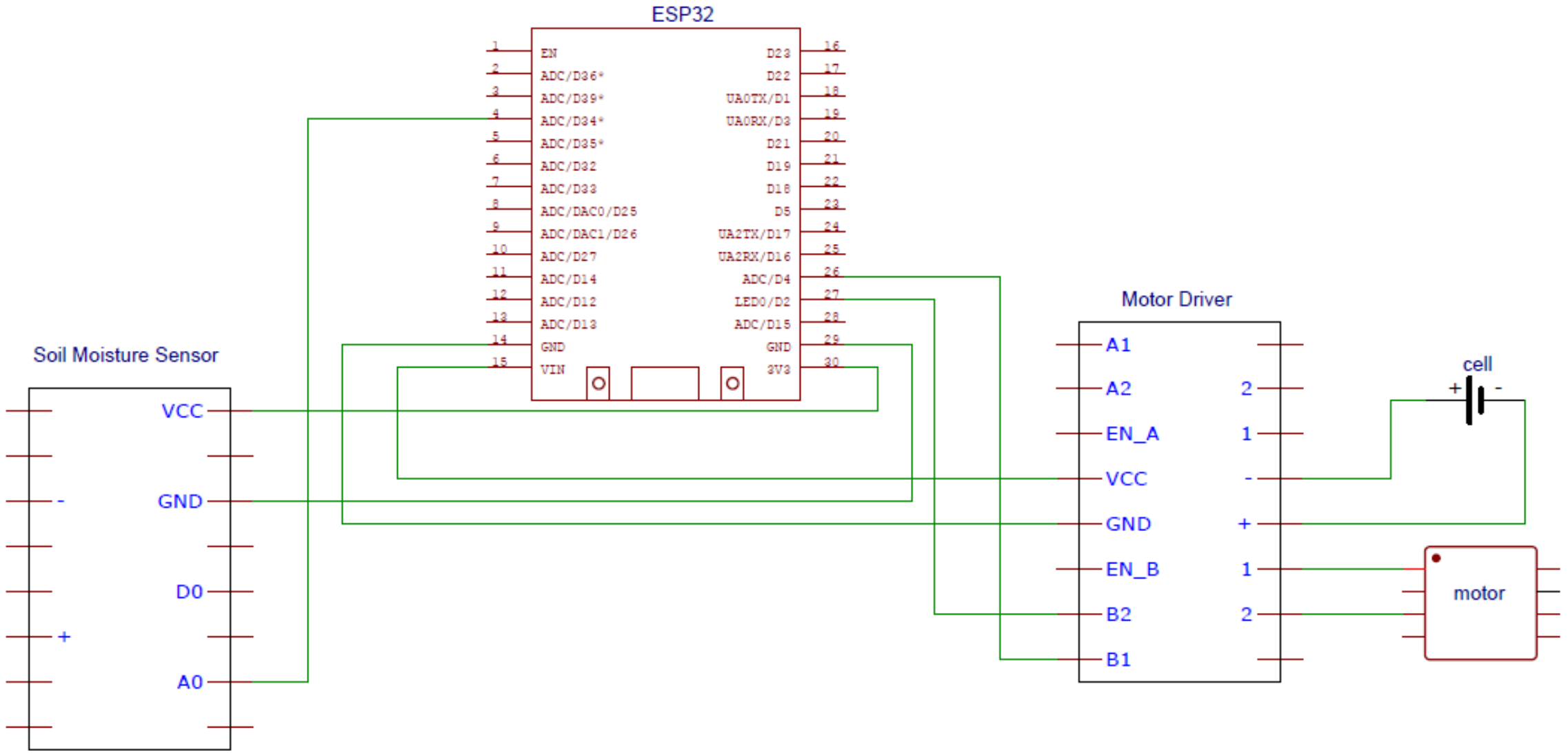
3. **Water pump**

4. **Jumper wire**

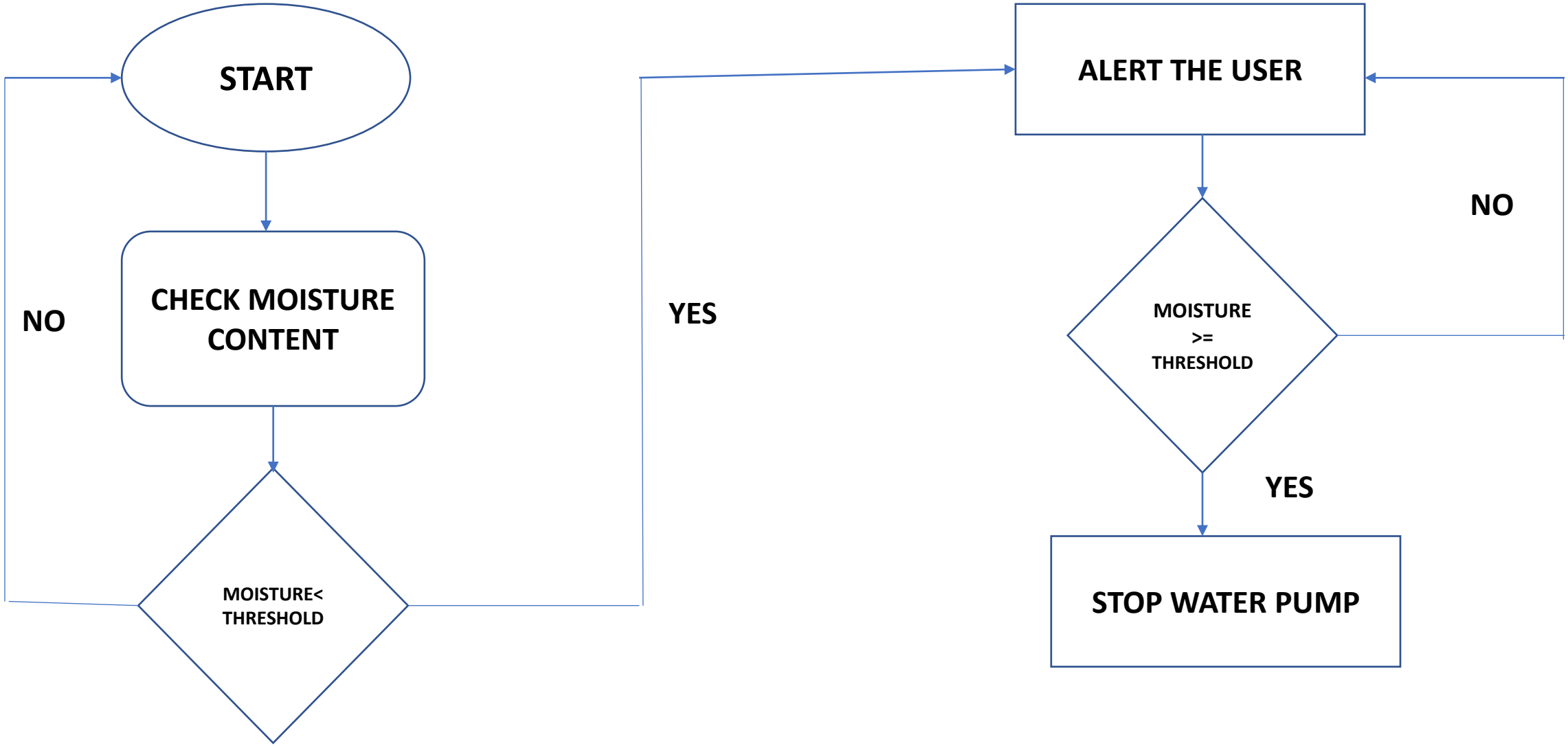
CIRCUIT DIAGRAM




ESP32
1 EN
2 ADC/D36*
3 ADC/D39*
4 ADC/D34*
5 ADC/D35*
6 ADC/D32
7 ADC/D33
8 ADC/DAC0/D25
9 ADC/DAC1/D26
10 ADC/D27
11 ADC/D14
12 ADC/D12
13 ADC/D13
14 GND
15 VIN
16 D23
17 D22
18 UA0TX/D1
19 UA0RX/D3
20 D21
21 D19
22 D18
23 D5
24 UA2TX/D17
25 UA2RX/D16
26 ADC/D4
27 LED0/D2
28 ADC/D15
29 GND
30 3V3
Motor Driver
A1
A2
EN_A
VCC
GND
EN_B
B2
B1
2
1
-
+
1
2
cell
+
-
motor


ESP32
EN
ADC/D36*
ADC/D39*
ADC/D34*
ADC/D35*
ADC/D32
ADC/D33
ADC/DAC0/D25
ADC/DAC1/D26
ADC/D27
ADC/D14
ADC/D12
ADC/D13
GND
VIN
D23
D22
UA0TX/D1
UA0RX/D3
D21
D19
D18
D5
UA2TX/D17
UA2RX/D16
ADC/D4
LED0/D2
ADC/D15
GND
3V3
Soil Moisture Sensor
VCC
GND
D0
A0
Motor Driver
A1
A2
EN_A
VCC
GND
EN_B
B2
B1
cell
motor

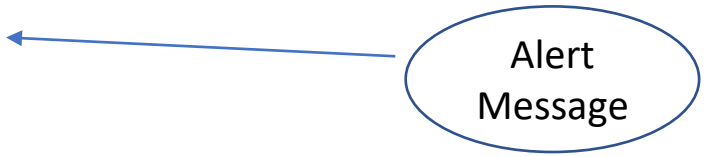
FLOW CHART

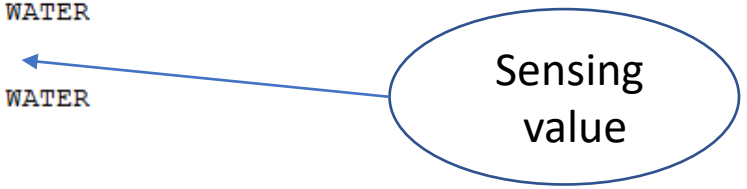

START
CHECK MOISTURE CONTENT
MOISTURE< THRESHOLD
NO
YES
ALERT THE USER
MOISTURE >= THRESHOLD
NO
YES
STOP WATER PUMP

SCREENSHOT

WHEN SOIL IS DRY

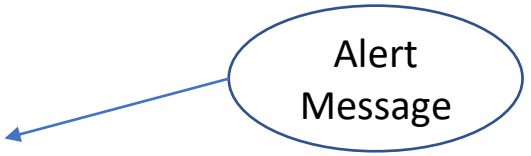
```
ets Jun  8 2016 00:22:57

rst:0x1 (POWERON_RESET),boot:0x13 (SPI_FAST_FLASH_BOOT)
configsip: 0, SPIWP:0xee
clk_drv:0x00,q_drv:0x00,d_drv:0x00,cs0_drv:0x00,hd_drv:0x00,wp_drv:0x00
mode:DIO, clock div:1
load:0x3fff0030,len:1344
load:0x40078000,len:13516
load:0x40080400,len:3604
entry 0x400805f0
WIFI CONNECTING..!!
WIFI CONNECTING..!!
192.168.43.92
3735
NEED WATER
3707
NEED WATER
3733
NEED WATER
4095
NEED WATER
3761
NEED WATER
```

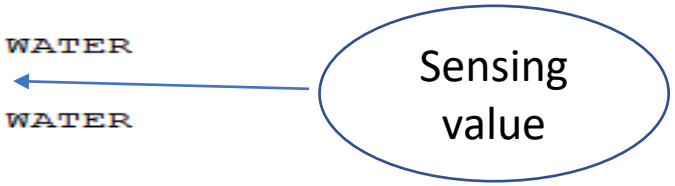




WHEN SOIL IS WET

```
NEED WATER
3707
NEED WATER
3733
NEED WATER
4095
NEED WATER
3761
NEED WATER
3771
NEED WATER
3795
NEED WATER
3799
NEED WATER
3819
NEED WATER
3839
NEED WATER
1453
ENOUGH WATER
1546
ENOUGH WATER
1583
ENOUGH WATER
1616
ENOUGH WATER
1639
ENOUGH WATER
```





TIMELINE

- Till **12/05/2022**, completed soil moisture sensing.
- Till **1/06/2022** , completed working of motor.
- Till **7/06/2022** , completed working of motor based on the value of sensor.
- Till **14/07/2022**, completed WiFi connection.

- By **20/07/2022** , water plants based on the sensing value.
- By **25/07/2022**, create android application for customizing settings.
- By **30/07/2022**, working of motor based on android app.
- By **8/08/2022**, completion of project.

CONCLUSION

- Smart irrigation is a water irrigation system using IoT.
- Here a sensor is placed on the soil to sense the moisture.
- If the sensed value is lesser than the threshold value, alert is sent to the user.
- And there by, User turns ON the motor.
- When the sensed value is greater than the threshold value, motor gets OFF automatically.

REFERENCES

- M. Rohith, R. Sainivedhana and N. Sabiyath Fatima, "IoT Enabled Smart Farming and Irrigation System," *2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS)*, 2021, pp. 434-439, doi: 10.1109/ICICCS51141.2021.9432085.

- M. Mayuree, P. Aishwarya and A. Bagubali, "Automatic Plant Watering System," *2019 International Conference on Vision Towards Emerging Trends in Communication and Networking (ViTECoN)*, 2019, pp. 1-3, doi: 10.1109/ViTECoN.2019.8899452.

- J. Karpagam, I. I. Merlin, P. Bavithra and J. Kousalya, "Smart Irrigation System Using IoT," 2020 6th International Conference on Advanced Computing and Communication Systems (ICACCS), 2020, pp. 1292-1295, doi: 10.1109/ICACCS48705.2020.9074201.

THANK YOU