AUTOMATIC WATER CONTROL SYSTEM IN IRRIGATION (AWCSI)

BY

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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DHAKA, BANGLADESH

SEPTEMBER 2022

APPROVAL

This Project titled "**Automatic Water Control System in Irrigation**", submitted by Pranto Biswas ID: 172-15-9787 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 12th September 2022

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We hereby declare that, this project has been done by us under the supervision of **Raj Tariqul Hasan Tusher, Assistant Professor, Department of CSE** Daffodil Internationa University. We also declare that neither this project nor any part of this project has bee submitted elsewhere for award of any degree or diploma.

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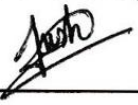

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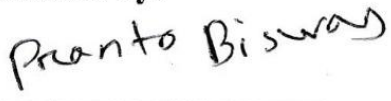

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ACKNOWLEDGEMENT

First we express our heartiest thanks and gratefulness to almighty God for His divine blessing makes us possible to complete the final year project/internship successfully.

We really grateful and wish our profound our indebtedness to **Raja Tariqul Hasan Tusher**, **Assistant Professor**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of "*IoT(Internet of Things), Embedded System, Android, Wireless Technology*" to carry out this project. His endless patience ,scholarly guidance ,continual encouragement , constant and energetic supervision, constructive criticism , valuable advice ,reading many inferior draft and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to Supervisors, Co-Supervisors, and Head**,** Department of CSE, for his kind help to finish our project and also to other faculty member and the staff of CSE department of Daffodil International University.

I would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, I must acknowledge with due respect the constant support and patients of my supervisor and my co-supervisor sir.

ABSTRACT

Bangladesh is an agriculture country. Most of the Farmer in this country Irrigate there land manually it means they went to their farming land and observe the land that was enough water or not, when they found there was not enough water in the land they star their motor manually and irrigate their land. It is difficult for farmers, they loss their important time, energy etc. In this cases Automatic water control system can be a solution to this types of problem. This system consist of three stages. Fast is sensing the land moisture. Second is resolution of its status: enough moisture or not. The third is Motor control. The work process of an automatic water control is that it collect the data of soil moisture from soil and send the data to the server and that data calculate by automatically and send them in motor via (%). When soil moisture 40-60% it means soil should not have water. When it down 40% the system will automatically start and irrigate the land. The system will automatically ON or OFF and send a message to the phone. When the land need water and it have not enough moisture the motor will start automatically. The soil for a certain duration, provides information related to the moisture status of the soil. This IoT based project highly use for farming, Nursery professionals by eradicating traditional or manual method of irrigation system. The main aim of this project to reduce irrigation cost, save time of farmer, save electricity, save man power and laborer cost. The node-MCU operate the system, with the help of soil moisture sensor and DHT11 sensor collect the land data and send them in the server after that server send those data via node-MCU then node-MCU commend the motor start or off it depend on the soil moisture level. Automatic Water Control System in Irrigation uses live input data to determine the conditions. This system utilizes the soil moisture sensor to detect water content level in soil and give appropriate responses to the system based on detected condition. This system represents our most basic step towards automated framing to improve turnover and reduce the impact of draught or loss due to irrigations issues. The benefit of employing these techniques is to decrease human interference and still make certain appropriate irrigation. Automatic Water control System in Irrigation is a revolutionary project for agriculture in future. This system make farmer life easy and comfortable for their irrigation system.

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CHAPTER 1

Introduction

1.1 Introduction:

In our country most of the farmer are irrigate their land manually. That's why great losses in agriculture: they loss their valuable time, material losses, financial losses, the main losses in crop health and quality. When the crop don't have proper water there production decrease and poor quality crop. In this situation farmer irrigate their land manually it means before the land dry they went their land and start the motor manually. The automated water control system will help to reduce the work load no farmers, and help the farmers to keep their farmlands well irrigated all times so that they produce their crops with low cost and decrease their trouble. Manually irrigated needs lots of manpower that's why irrigation cost increase. This system help irrigate lands even single-handedly without the need of additional manpower. It is user friendly simple circuit and sensors which is connected with the pump or motor. The farmer only need to install this circuit and sensors with the motor. The system will automatic control the irrigation system. The motor will be auto ON or OF when dry or well moisture. The sensor collect data from soil and send to the system, it calculate the moisture and command the motor ON when dry and OF when well moisture. This system work fast all the sensor collect data then send those data in the server and the server send the data in the node-MCU then the circuit active and give the command for starting or stop the motor.

1.2 Motivation:

Necessity is the key resonance of discovery. The motivation for this project came from when I see my father works hard for irrigating our farming land. Some time he depend for rains and scarcity of water. If my father face the problem then our country is mostly depends on agriculture most of the farmer face same problem. All the farmer need some smart system that has solved their problem. They need some low cost system which should reduce their cost, save their time, laborer cost and their physical hard work.

The main aim of my project is detect the soil dryness and provide appropriately water for plants. This project will detecting soil moisture, humidity, temperature and need for irrigation. Saved water from being wasted as there is on un-planned usage of water.

1.3 Objectives:

Automatic Water Control System in Irrigation, it is an IoT-based project which is contain a web service and server based system. By which we can use it in our irrigation that is connected via Wi-Fi network.

There is some sensors and circuit application connected to the user devices. This system can be monitored, control remotely. We can handle our system components. The main reason is reducing farmer's time, lack of rains and scarcity of land reserving water. We can use this system in many scope like nursing planet, home gardening and etc. This system reduce farmer's production crops cost, electricity bill and laborer cost.

1.4 Expected Outcomes:

By using this system a farmer can control his farming land moisture automatically and manually. Automatically system done by an application which is connected with the server. Farmer also can see the temperature, humidity and soil moisture which is help them took a decision to turn ON or OF the motor. When moisture level I mean soil moisture sensor percentage under 10% the motor will automatically ON and when moisture level higher than 80% the motor will OF. This system also give a notification to the user phone. The notification came via a database I use Adafruit free cloud server database. This server store the data and give the data via MQTT dash. Then user see the current information of his system.

1.5 Project Management and Finance:

First of all, I thought about my project, I made a time duration and cost management list to route and manage the work process of my project. Then I started my journey. The journey was based on management and time duration which is not so much easy for me. I face many problems and financial issues. But overcome all issues I have successfully completed my project in the limited time and probably lower cost.

As my project contains two systems, so I need to buy some hardware component and with limited cost and complete my project. I use the free cloud server which is Adafruit cloud server. For user interface I use free mobile dash which is known as MQTT dash. I try to make this system minimum cost so that farmer can use this and they have no need to pay for this system.

1.6 Report Layout:

- **Chapter 1:** is all about introduction, motivation, objectives, expected outcome, project management and finance.
- **Chapter 2:** background of the project. It clarify the related works, summary of the work and the challenges of the project.
- **Chapter 3:** In this chapter all about the requirement specification of my project.
- **Chapter 4:** The design specification of the project like flow diagram, flow chart, circuit diagram are here.
- **Chapter 5:** My project implementation features like how to implement all the element, sensor, NodeMCU etc. are here.
- **Chapter 6:** All about impact on farming land and impact on environment of my project or system are to discuss here.
- **Chapter 7**: Concludes, future scope, limitation and reference of the project are discuss here.

CHAPTER 2

Background

2.1 Terminologies:

This system is made for reducing farmer cost of irrigation, electricity wastage, saved farmer time. With the help of this system farmer can control in his irrigation from home or anywhere. The system will be control automatically and also manually by a user-friendly app. This project is aimed at modernizing agriculture in Bangladesh. The increasing of food requires demand day by day the rapid improvement in food production technology.

2.2 Related Works:

Automatic Water Control System is a process of controlling water in land that could be controlled automatically such a water pumps, motor and so on.

2.3 Comparative Analysis:

WLAN in more effective and common nowadays. So the utilization of wireless network gives more advantages in Automatic Irrigation System.

- **Reducing installation cost:** WLAN control system is on a user friendly.
- **Deployment, coverage and installation are easy:** Anywhere WLAN system coverage and installation process age easier, so that anyone can control from anywhere.
- **Scalability and extension:** Using WLAN network is very easy because of changed requirements of the network is important.
- **Benefits:** The wireless nodes is very easy to placement so the requirement of nodes can be managed very simply.

2.4 Problem:

It is a wi-fi system project which is can control by user his water pump. This system without using manual setup. The pump will be ON or OF automatically by the information data which is given via database. So if somehow the internet connection will bad or enable to connect with the system then the whole system will be damaged. Another is if the databases are not to able provide the data properly the system will be damage. Since I use free

databases it may crash and enable to send data properly then the all system will be damage. Also I used many type of electronic devices and sensors there are mostly possible of failure to sending data properly from all components of Node MCU or possibility of sensor destroying overvoltage supply.

2.5 Challenges:

- Components availability.
- Supply data through Arduino to Node MCU
- Power supply to Motor problem.
- Voltage fix problem.
- Connect the database with the application.
- Using free databases which is make some problem.
- Budget for project.
- Circuit failure.
- Write the code to collect data from sensors.
- Bugs detect then fix bugs.
- Motor wasted
- Using free mobile dash which is not work exactly
- Wi-fi make some problem
- Sensor are not work properly fix them.

CHAPTER 3

Requirement Specification

Hardware requirements and analysis:

Serial No	Component	QTY
1	Node MCU	1
2	Soil Moisture Sensor	1
3	DHT11	1
4	DC Motor Pump	1
5	5V Relay	1
6	9V Battery	1
7	Connecting wires	….

Table 3.1: Hardware requirements and analysis.

3.1 Node MCU esp8266:

NodeMCU is an open source low-cost IoT platform. It initially included firmware which runs on the ESP8266 Wi-Fi SoC from Espressif System, and hardware which was based on the ESP-12 module.[1] This firmware uses the Lua scripting language. Advantage of this module are below.

- Easy to use
- Low cost.
- Support or Wi-Fi
- Easy to load the code
- Easy for available

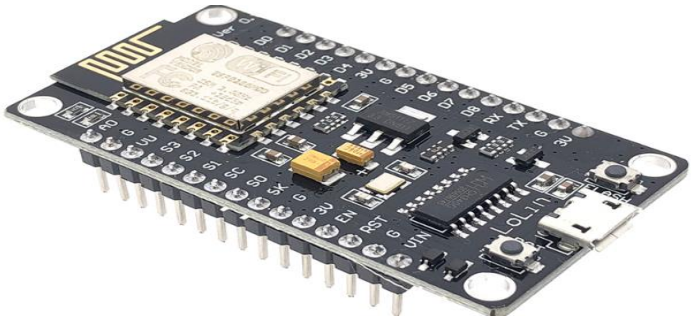

Figure 3.1.1 ESP8266 wi-fi Node-MCU

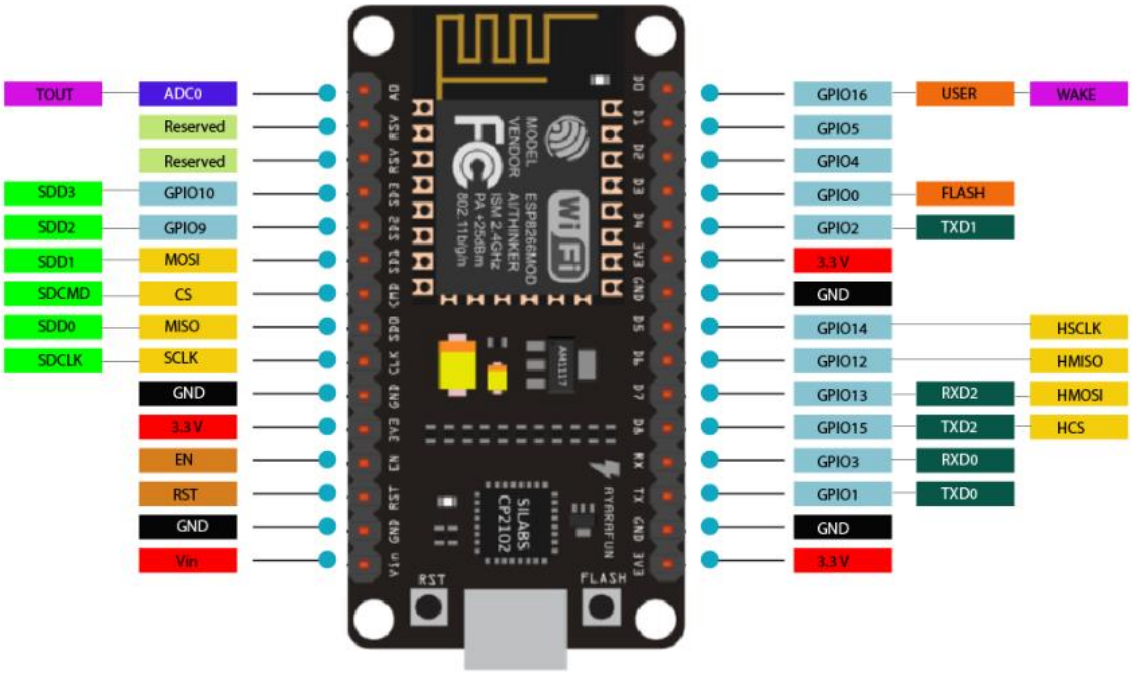

Figure 3.1.2 NodeMCU pin configuration

3.2 Soil Moisture Sensor:

Soil moisture sensors measure the volumetric water content in soil. [2] Since the soil moisture depend on gravimetric measurement of removing, drying and weighting of a sample, soil moisture sensor measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content. For a soil sensor to work, no matter the type, it must make contact with the soil. The highest accuracy will be obtained when the

soil sensor is entirely surrounded by the soil, with no gaps between the probe and the soil [3]. Soil moisture profiling probes measure moisture content across a vertical soil profile, typically spanning a range of 30cm to 120cm. Most usually consist of multiple single-point sensors housed with an elongated enclosure; this type of geometry allows for several points to be installed quickly and at one time. The soil moisture sensor detect the moisture laver from the soil and give the result to us. Suppose we want to measure our farming land moisture the sensor help us to measure this very softly.

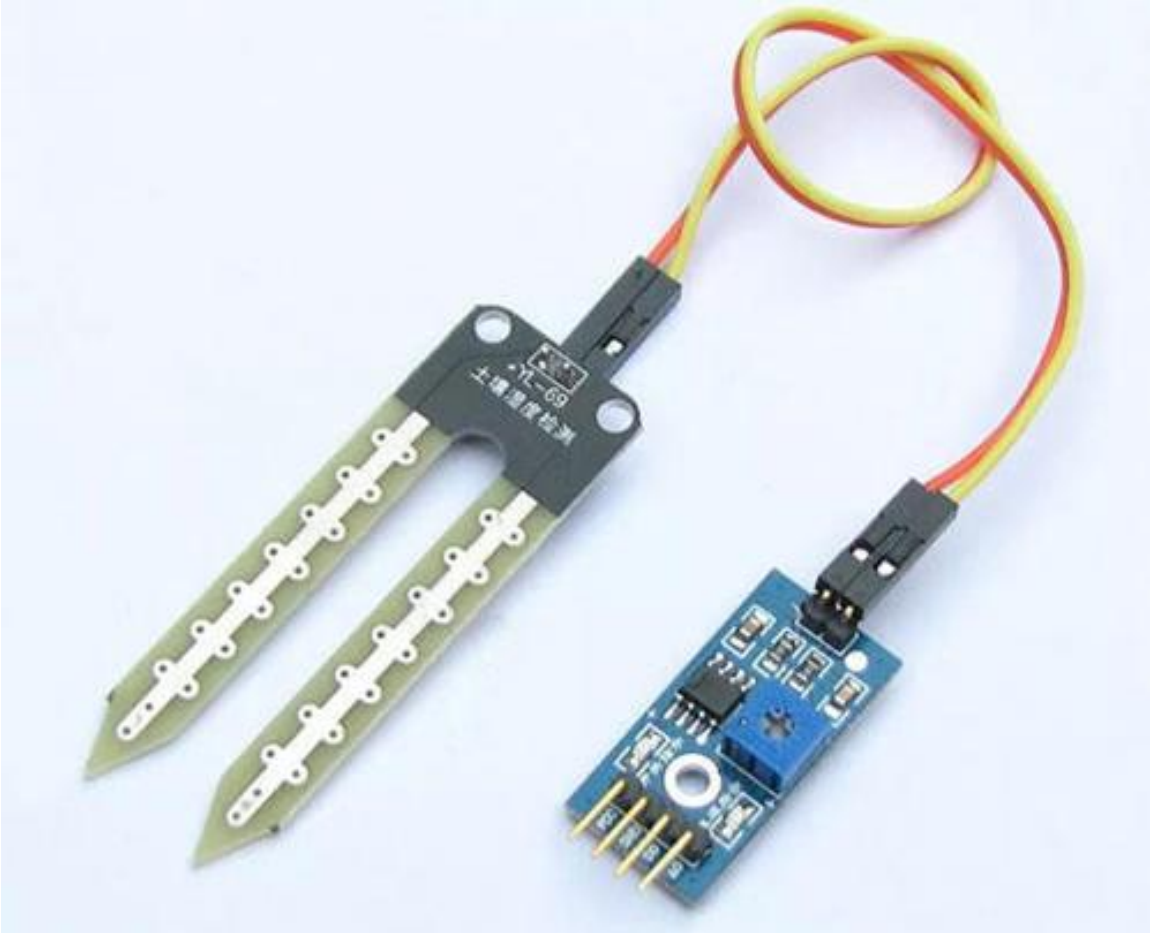

Figure 3.2.1 Soil Moisture Sensor

3.3 DHT11 Sensor:

DHT11 is a temperature and humidity sensor is available as a module and sensor. [4] This sensor consist of a capacitive humidity sensing and thermistor for temperature sensing. This sensor sense the humidity and temperature from the environment. The humidity sensing capacitor has two electrodes. The temperature measuring sensor uses a negative temperature coefficient thermistor.

The temperature rang 0 to 50 degree Celsius with 2 degree accuracy. Humidity range 20 to 80% with 5% accuracy.

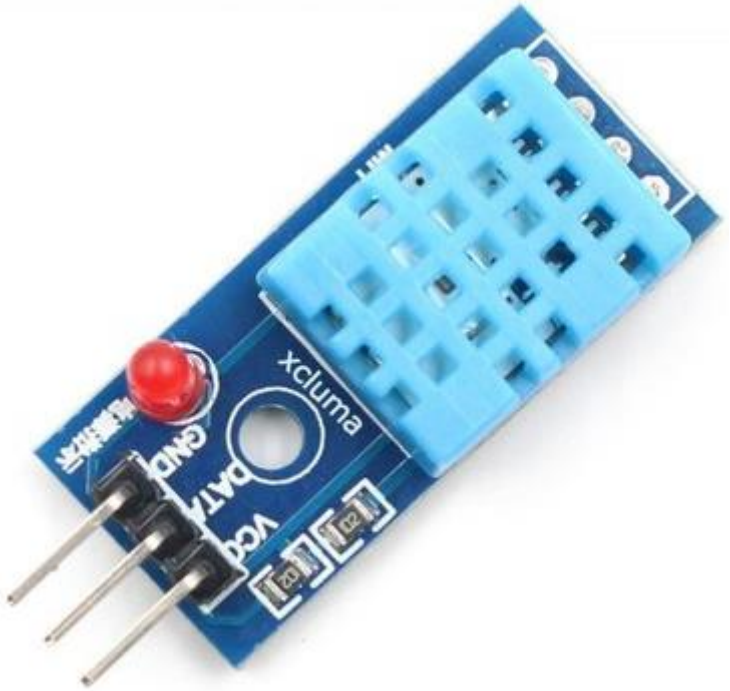

Figure 3.3.1 DHT11 Sensor

3.4 DC Motor Pump:

DC motor is an electrical machine. Which is transforms electrical energy into mechanical energy by creating magnetic field which is powered by direct current. [5] DC motor have two working state one is Rotor and another is Stator. When the powered is on the rotor is used to rotate. To keep the rotor continually rotating. The stator is a fixed part it holds permanent magnets and brushes to supply current to the rotor on the other rotor holds a windings.

The armature of a DC motor is a cylinder of magnetic laminations that are insulated from one another [6]. The armature is perpendicular to the axis of the cylinder. The armature is a rotation part that rotates on its axis and is separated from the field coil by an air gap. A DC motor stator is a non-moving part on which winding is wound to produce a magnetic field [7]. This electromagnet has a cylindrical cavity between its poles. This is the two main part of a dc motor another one is Brushes the brush unit are concerned with transmitting the power from the static electrical circuit to the mechanically rotating region or the rotor. A magnetic field arises in the air gap when the field coil of the DC motor is energized. The created magnetic field is in the direction of the radii of the armature. The magnetic field enters the armature from the North Pole side of the field coil and "exits" the armature from the field coil's South Pole side.

Figure 3.4.1 DC Motor Pump

3.5 5V Relay Module:

Relay is a switch which is operated by electrically. Many type of relays use an electromagnet to mechanically operate a switch but another principles are also used like solid state relays. Relay are used for converting low voltage current to high voltage current and high voltage to low voltage. First relays use in long distance telegraph circuits as amplifiers. [8] Relays are used for highly versatile components just as complex circuits as in simple. A 5v relay is an automatic switch that is commonly used in an automatic control circuit a control a high-current signal. The input voltage of the relay signal ranges from 0 to 5v [9]. The relay module with a single channel board is used to manage high voltage, current loads like solenoid valves, motor, AC load and lamps. This module is mainly

designed to interface through different microcontrollers like PIC, Arduino, etc. This module includes 6 pins each pin and there functionality discussed below.

- **Normally Open (ON):** This pin is normally open unless we provide a signal to the relay modules signal pin.
- **Common Contact:** This pin used to connect through the load that we desire to switch by using the module.
- **Normally Closed (NC):** This pin is connected through the common pin to form a closed circuit.
- **Signal Pin:** The signal pin is mainly used for controlling the relay. This pin works in two cases like active low otherwise active high. In active low case, the relay activates once we provide an active low signal toward the signal pin.
- **5V VCC:** This pin needs 5v DC to work. So 5V DC power supply is provided to this pin.
- **GND:** This pin connect the ground terminal of the power supply.

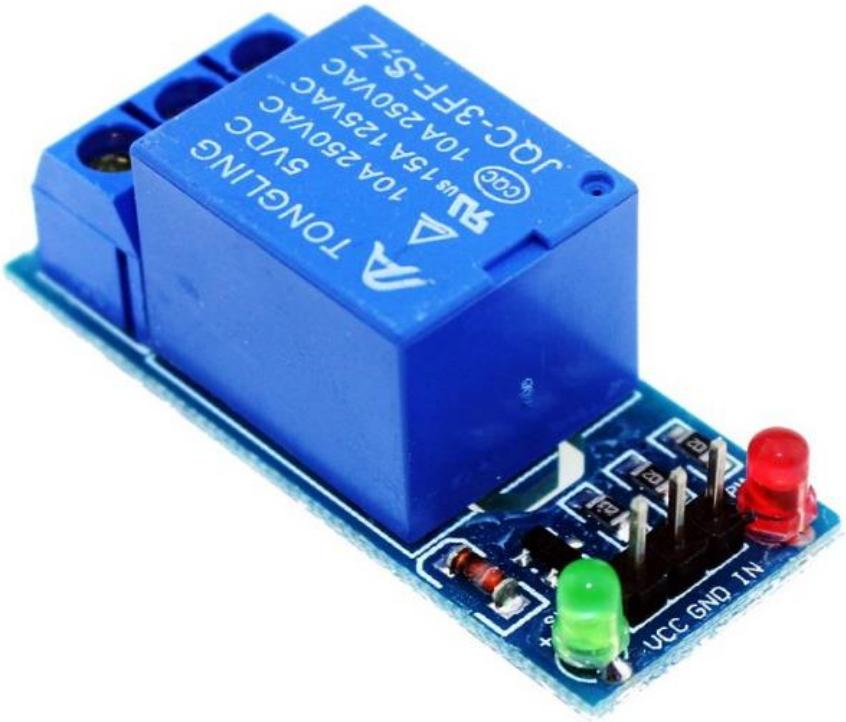

Figure 3.5.1 5V Relay Module

3.6 9V Battery:

The 9V battery is an electric battery which is supplies a nominal voltage of 9 volts. The actual voltage measures is 7.2 to 9.6 volts, which is depend on manufacturing company and chemistry. A battery is a device that store chemical energy and converts it to electrical energy [10]. The chemical reactions in a battery involve the flow of electrons from one material to another, through an external circuit. The flow of electrons provides an electric current that can be used to do work [11]. To balance the flow of electrons, charged ions also through an electrolyte solution that is in contact with both electrodes. Different electrodes and electrolytes produce different chemical reactions that affect how the battery works, how much energy it can store and its voltages.

Zinc in a diluted sulfuric acid gives up electrons as below:

$$Zn \longrightarrow Zn^{++} + 2e^-$$

These Zn++ ions pass into the electrolyte, and each of the Zn++ ions leaves two electrons in the rod. As a result of the above oxidation reaction, the zinc electrode is left negatively charged and hence acts as a cathode [12].

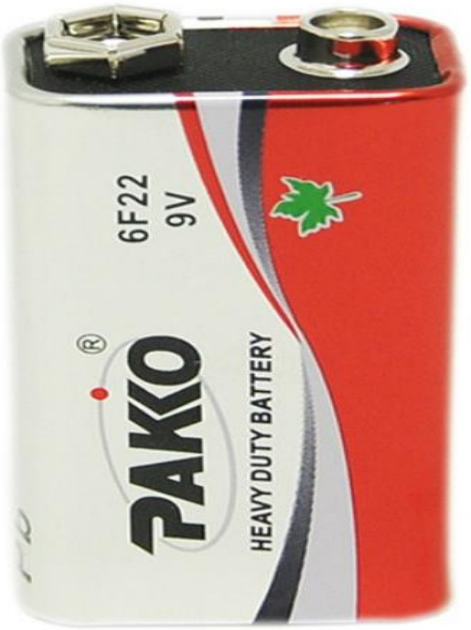

Figure 3.6.1 Battery 9V

3.7 Software Requirement:

- **Arduino IDE:** This is an open-source software which makes it easy to write code for IoT project and upload it to the board. This software can be used any kind of arduino board. I use Arduino IDE for writing my project code. The Arduino IDE contain for text editor for writing code, a message area, a toolbar with buttons for common function and a series of menus and a text console. It is use for connect Arduino hardware to upload the programs and communication with them [12]. Programs written using Arduino Software are called sketches. These sketches are written in the text editor and are saved with the file extension .ino. The editor has features for cutting/pasting and for searching text. The message area gives feedback while saving and exporting and also displays errors.
- **Database:** I use Adafruit Database which is free. This database provide us free service. This is a platform designed to display, interact and respond with my project. They also keep my data privet and secure. Her goal was to create the best place online for learning electronics and making the best designed products for makers of all ages and skill [11]. This is a free cloud database. We can use this server for free and store our data free. This is a popular server in this day because of developer can create feed and those feed are store developer data and give the data when developer need. This database use for any type of data to store and maintain all the data. Adafruit access us for 30 day because of this is a free cloud server. We could see our system result and feed like a chart or graph and we understand the result easily.

- **MQTT Dash:** this is an android software which is provide me to create a user interface dashboard. Using this dashboard user can see the recent situation of his project. 1st user should install MQTT Dash from play store. Then open the dash and create some feed. The feed collect the data from that store data in Adafruit database. Then take some button, take some geared and a switch. This is a simple and beautiful tool which is control my MQTT-manage my home automation system or my project Automatic Water Control system in Irrigation and enabled my devices.

CHAPTER 4

SYSTEM DESIGN

4.1 Flow Chart:

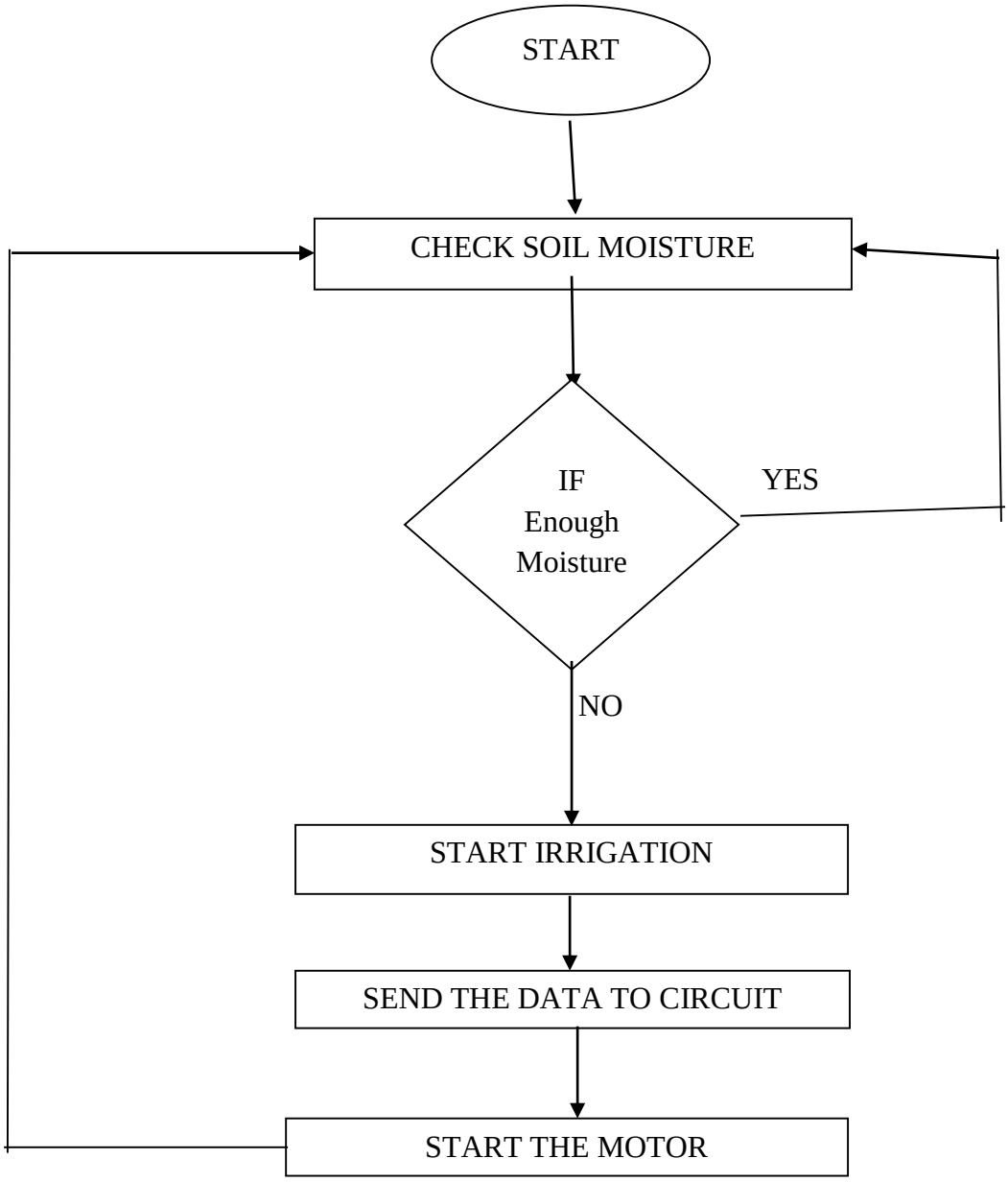

Figure 4.1.1 Flow Chart of the Circuit

4.2 Flow Diagram:

Here is the flow diagram of the system. First the sensor take the input from the land then operational amplifier start and the soil moisture sensor take the soil moisture level it send the data to the circuit and the NodeMCU commend to motor depend on the soil moisture level. If the level is under 10% then the motor start and send the data in the cloud server then server send it via wi-fi on the mobile MQTT dash. And user can see the status. Then when moisture level reached on 80% the circuit commend the motor to turn OFF.

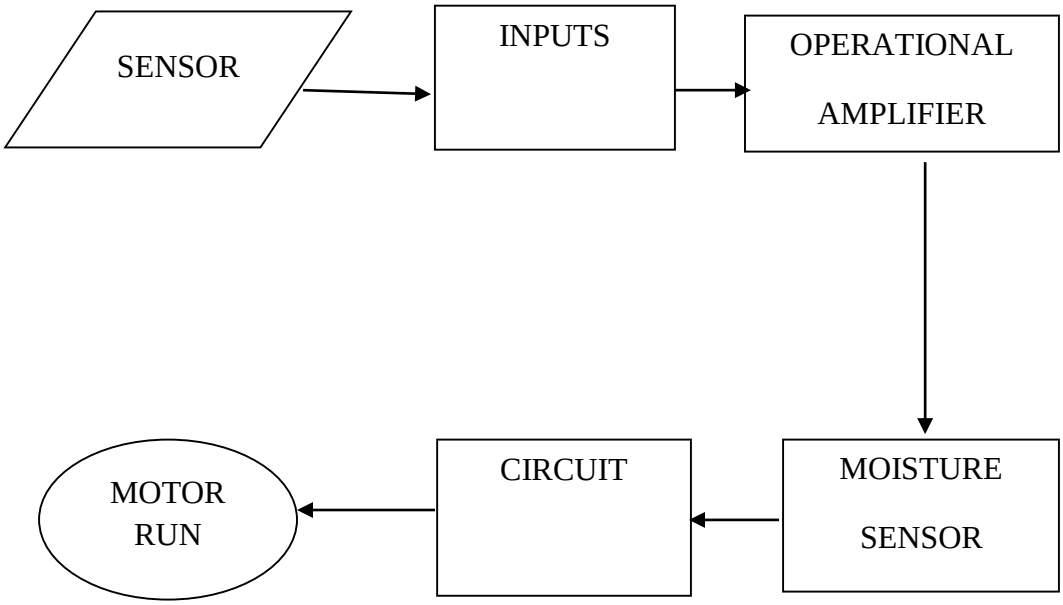

Figure 4.2.1 Flow Diagram

4.3 Circuit Diagram:

The circuit diagram of the Automatic Water control system are discusses below. First I connect the soil moisture sensor with the NodeMCU. Soil moisture sensor GND connect with NodeMCU GND, VCC connect with VCC and A0 connect with NodeMCU A0. Then connect the DHT11 with the pin connection like soil moisture sensor. All the element are connect with NodeMCU like that. The Diagram are below.

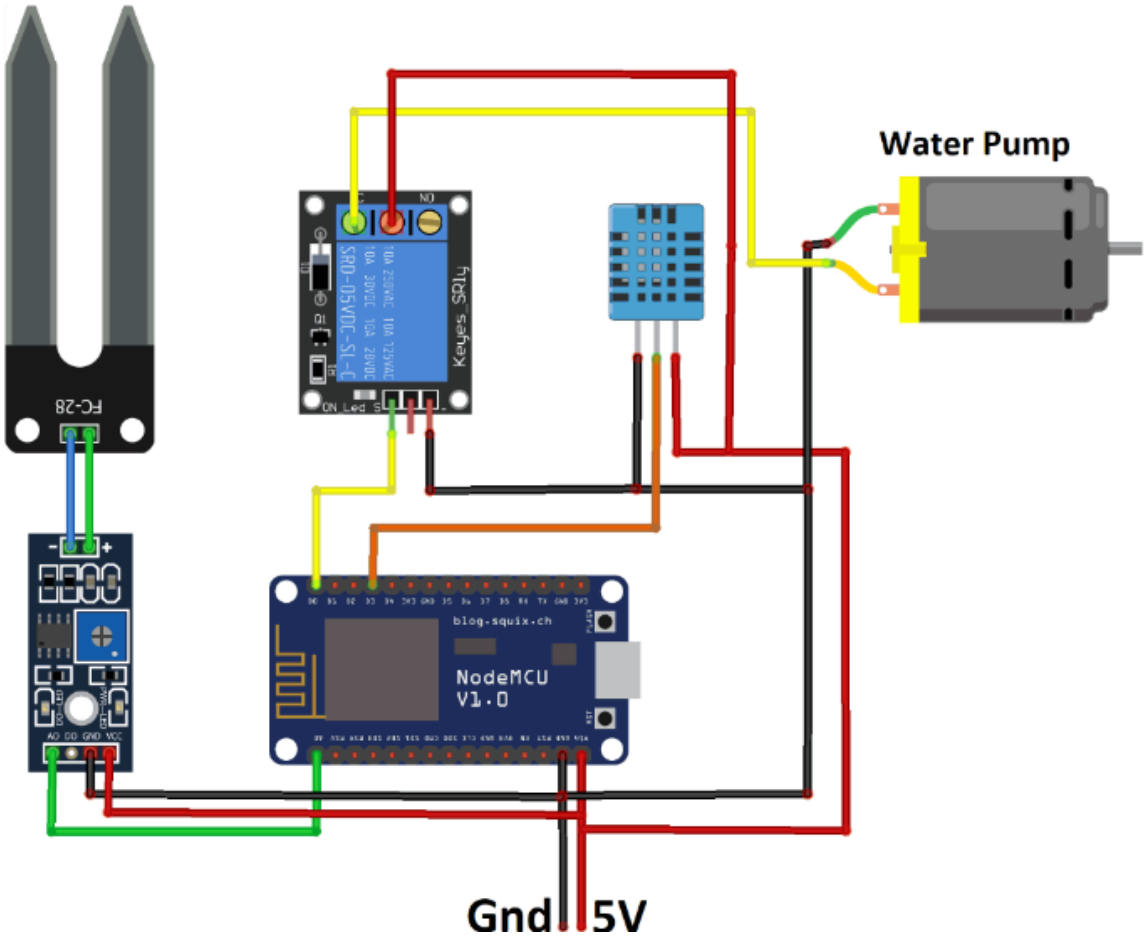

Figure 4.3.1 Circuit Diagram

4.5 User Interface:

- **Database:**

  I use a free cloud server to store my data which is collect via sensor. The database is known as Adafruit cloud server. The server give as free accesses and we can easily store our data on that server. After that we collect the data and send them in our MQTT dash then the android dash show us the data. In this server first we need to create some feed for storing the data. I use two sensor in my project those sensor collect three type of data from the land and environment. The collect soil moisture level, humidity and temperature. So for the three data I create feed in my

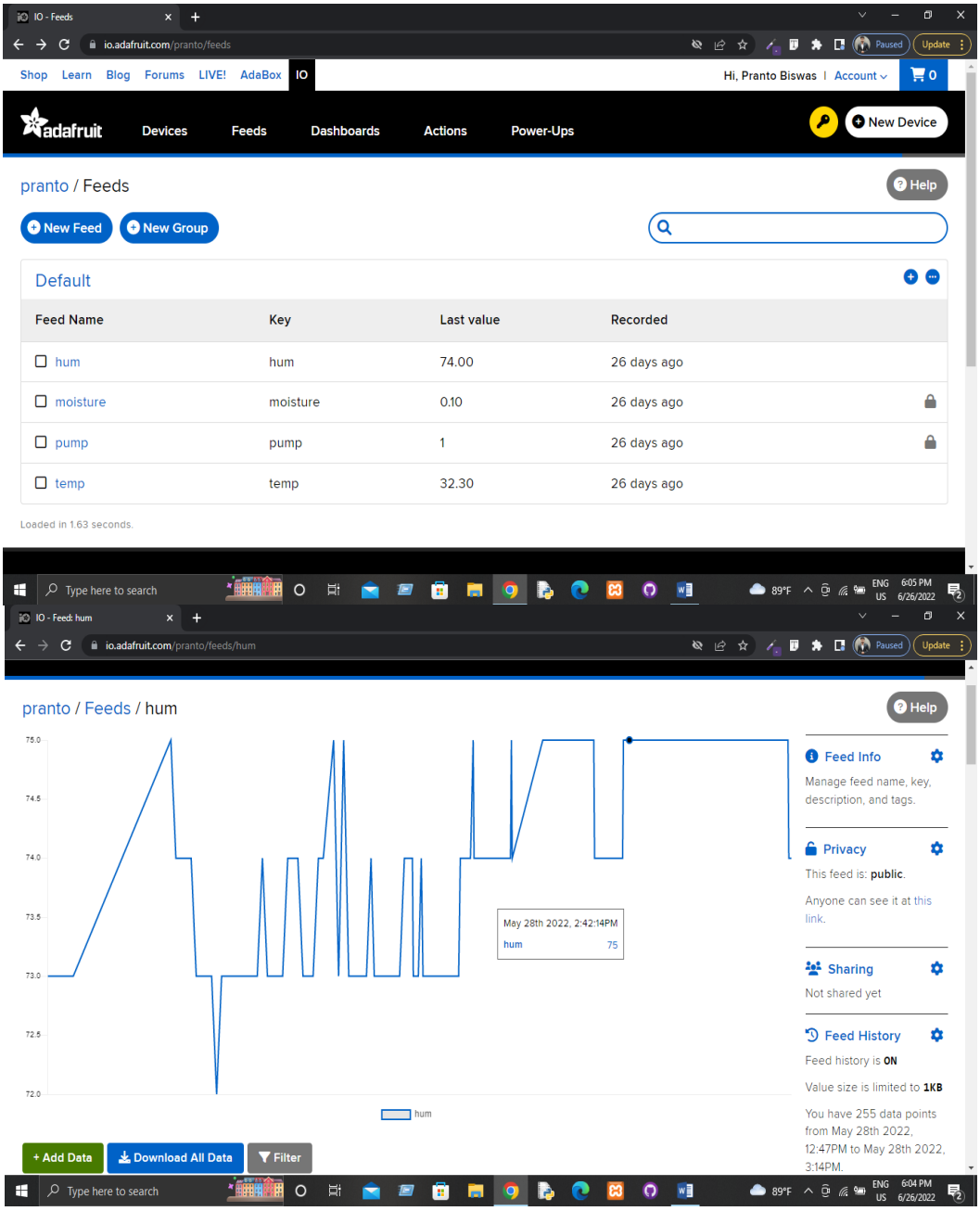

Figure 4.4.1: Humidity feeds

This is the feed which is show the data like graph and chart. This data from the sensor and time duration is 10 sec. The data collect or show after 10 second and send this data in MQTT dash via wi-fi.

Figure 4.4.2 Database Feeds

4.4.2 Mobile Interface:

I use MQTT Dash android mobile app to create User Interface that can show recent status of the project. There are four component in my project dash. Three are geared witch is show the sensor value and one is show the motor status.

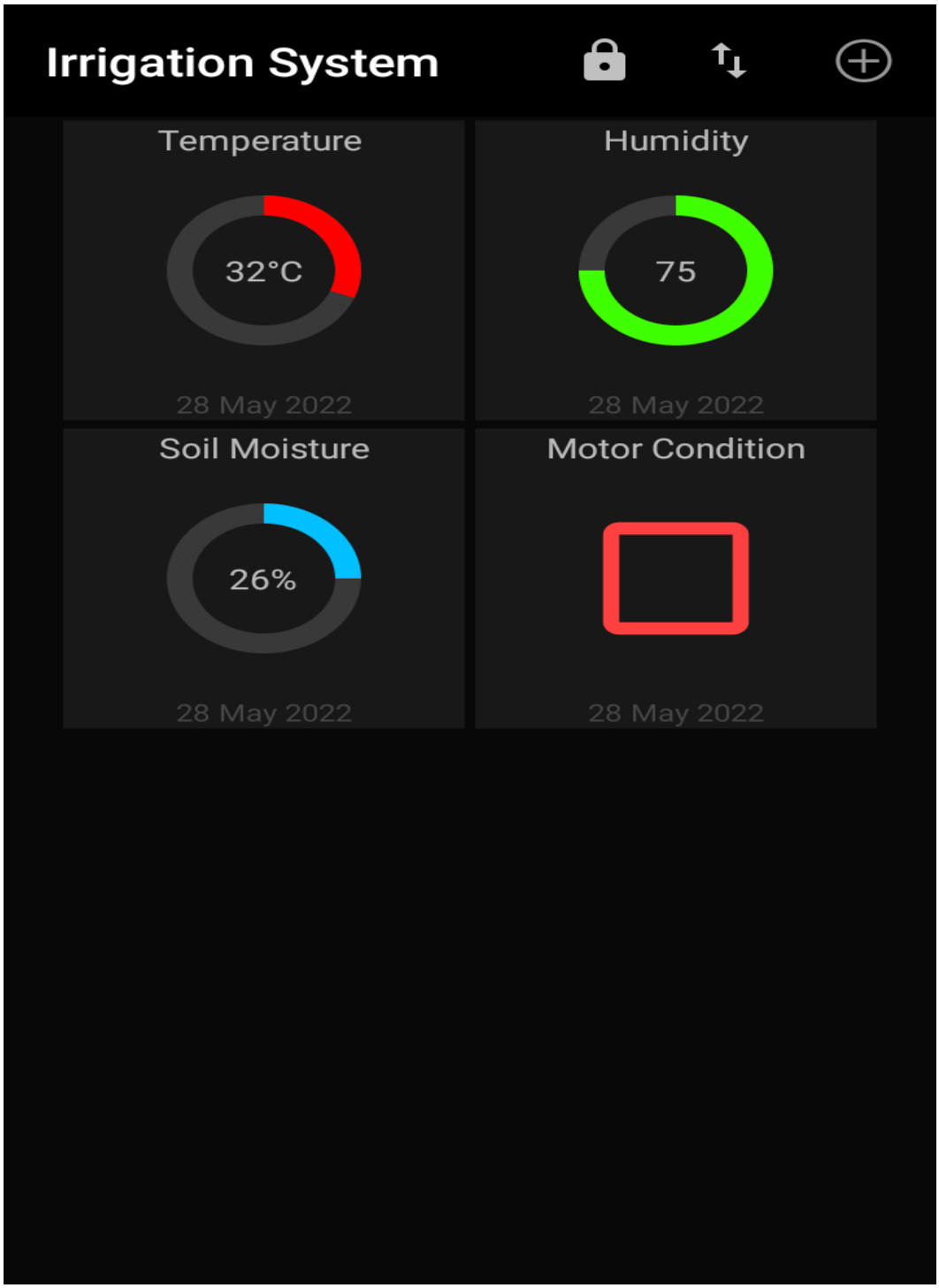

Figure 4.4.2 Mobile Dash

CHAPTER 5

SYSTEM IMPLEMENTATION

5.1 Methodology:

The true implementation of this project needs the actual design that I have made in the System Design phase.

For past few years automated irrigation systems have really bought a huge change in our agriculture. These systems have reduced cost, a huge amount of time as well as farmer's hard work. This revolutionary change has really helped us in both commercial and economic sectors. Whereas, this proposed system is a smart irrigation system that automatically detects if the field is dry or moisture. If it is enough moisture (below 40%), the system will be off otherwise it will be automatically turned on and provide enough water until it gets moisture enough (above 60%). This system will bring a huge change in the industry of food production by lowering the cost, time, and hard work. Ultimately the main beneficiaries will be the underrated farmers who are the true backbone of our industry of agriculture.

5.2 System Planning:

To make a successful system a proper planning is mandatory. The main objective of the planning phase is to predict the cost and time needed for the project. The project framework is created to check if the requirements are fulfilled by the project or not. In most of the cases the maintenance cost is far higher than the making cost of a system and even sometimes the time the system takes is much higher that requirements. So to reduce those kinds of costs and time a proper planning is much needed to estimate the time and cost properly.

5.2.1 Initial Planning of The System:

First of all making a planning was a crying need to make this system because I was really worried about an outcome which was not planned. It could have gone terribly wrong. I primarily investigated about the current irrigation systems which are currently being used by our farmers. Visited a lots of places to do that and observed that they use the same old system and it costs them their valuable time and even they stay awake whole night to check

the water level in different field while providing water to the fields. It also costs them a lot. So, from that I was even more determined to make this system. As the do all things manually, I planned to make this system automated so they don't have to stay awake all night to just turn a switch off. There are some other systems that are made recently that could work but they have some flows that I don't like. To make a new one seemed more easy and convenient that to modify one of them. So, to complete this project I thought of moisture sensor which could detect if the field needs water or not. And to use that in the system I had to use some other components to connect that sensor and to make it automatic I had to use a NodeMCU to make this possible. That's hoe the primary planning went for me.

5.3 Working:

The main working process of this project consists of two parts. One is hardware or external connections and the other is internal or coding section. I am going to elaborate all the external connections and configurations down below.

First of all I collected esp8266 NodeMCU, a soil moisturizer sensor, DHT11, single channel 5 volt relay, water pump (3-6 volt), and a 9 volt battery.

As the NodeMCU is connectible to the wi-fi, I used this model. I connected soil moisturizer with this NodeMCU exactly as following. I connected the vcc of the NodeMCU with the vcc of the Soil Moisturizer, GND with the GND, and A0 with the A0 and established the connection. Here, I used soil moisturizer sensor to collect the data of the soil.

Then I used DHT11 sensor to detect humidity and temperature of the environment. I connected it with the NodeMCU by connecting both of their vcc with vcc, GND with GND, and data/output of the DHT11 with esp8266's output.

Then I added water pump with the NodeMCU by connecting both of their GND, the positive of the water pump with the positive of the relay, the ground of the relay with the GND of the NodeMCU and another pin of relay connect of the NodeMCU pin A1.

By connecting these the whole system was made ready. And then comes the internal configuration.

5.4 Coding Section:

For collection data from farming land via soil moisture sensor I use some code in Arduino IDE with the library. I use some algorithm calculate the data that is collected by soil moisture sensor.

Then I use Adafruit database cloud server to store those data that was collected by soil moisture sensor and DHT11 sensor. Adafruit gives us free server where we can store our data free and we use those data any time.

After that I use MQTT dash which is an android app that is give me to create a user interface which is free.

Finally I created an interface which is an android application by using which the farmer can observe each and every condition of the system live. Thus the system was ready.

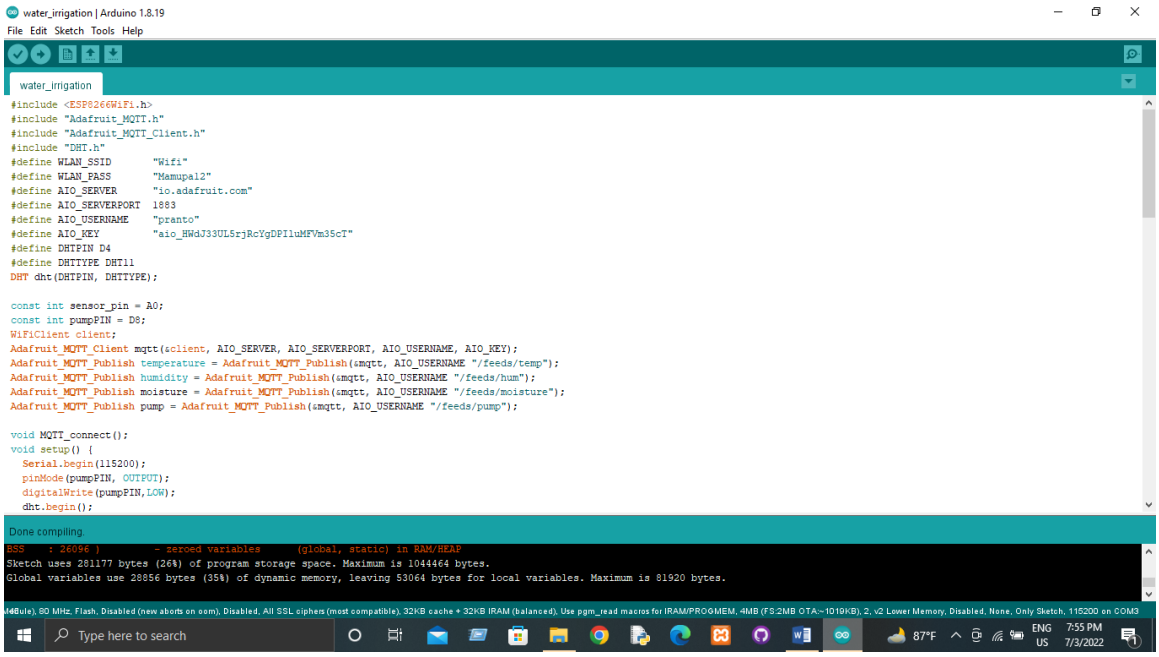

Figure 5.4.1 Code of the project.

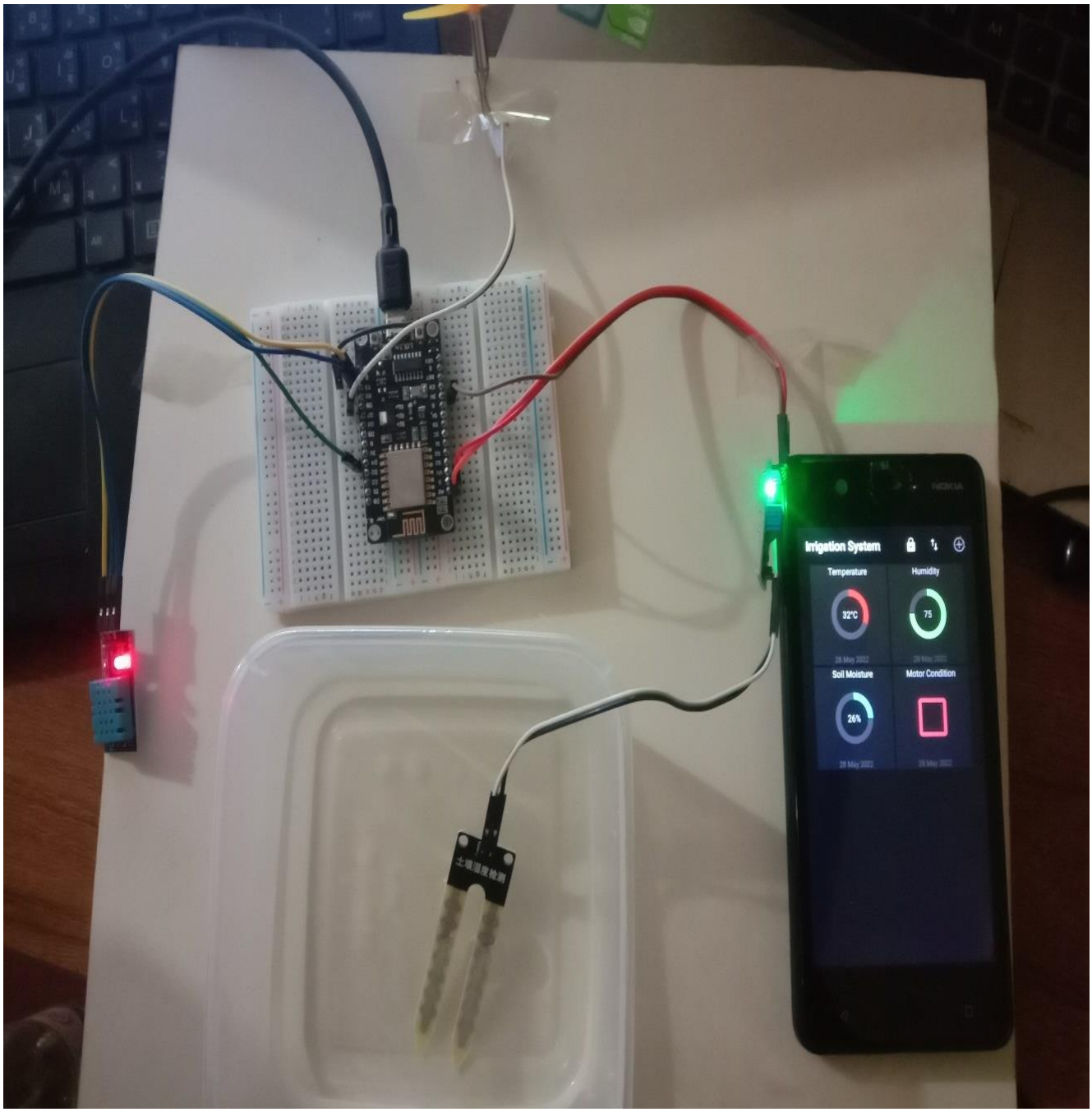

Figure 5.4.2 Final Project

Chapter 6

Impact on society and on environment

6.1 Introduction:

In this part we have actually added the main impact this project will do for the society. And with this impact on society it will definitely make another impact automatically on the environment. We are going to discuss them below where, in 6.2 section we will be discussing about the impact on society and in 6.3 we will discuss about the impact on the environment.

6.2 Impact on the Society:

Currently most of the time water, time and money are being wasted regularly by the farmers. They know it but they can't do anything about it. Because they are not robots. They sometimes forget to turn of the machines while watering. Because of this both water and fuel is being wasted. Overwatering can also be a great danger to the crops. And definitely a lots of times of the farmers are being wasted. All of these problems are going to be solved and solved correctly using this system so definitely this will impact the rural society in a huge way. Farmers will have to do very less work and get a very correct accuracy at their work. So they can give their time in other places. Thus the production will be increased and this will impact our food and beverage industry and whole country will be benefitted.

6.3 Impact on the Environment:

Now most of the farmers uses shallow machine or manual water pump for watering their farming lands which uses the natural oil or diesel. By burning this oil the machine provides water. But when the oil burns it produces a lots of Carbon-Di-Oxide and release it to the air. This causes a lot of problems for the environment as we all know what effects happens with more CO2 in the air. Using this system will require electricity as power. So, no CO2 is released. If, for all the irrigations, farmers uses this system a huge amount of CO2 will not be produced and this will make a tremendous good impact on the environment.

CHAPTER 7

Conclusion and Future Scope

7.1 Conclusion

Bangladesh is an Agriculture country. But the revolution of internet and IT there is no effect on Bangladesh agriculture. When internet is using and adjusting any type of regular activities but agriculture sector have no effect. In this case IoT is have a nice ability to grown up agriculture. A farmer depend of the rain or manual motor to enough water in his farming land. But the modern world irrigation becomes easy they don't need to depend on rain or manual water motor they use advance system.

"AUTOMATIC WATER CONTROL SYSTEM" (AWCS) is the idea that can be implemented in agricultural fields to promote Bangladesh agriculture to next level. The soil moisture sensor and DHT11 sensor and the system plays major role in producing the output. The system has been designed and tested successfully. It has been developed by all the features and hardware components. Every module and components placed carefully according to the working unite. The soil moisture sensor collect the moisture level data from the farming field and sent the data to the cloud server those data collect from the by signal to the operational amplifier or relay module and the DC motor water pump turn ON or OFF according to the data. If the moisture level below moisture level then the motor will be ON and when the moisture level enough moisture then the motor will be OFF automatically. Thus the entire system functionality has been tested and it said to function successfully.

7.2 Limitation:

- The NodeMCU is can't able to supply the proper voltage because of it is version 3 NodeMCU.
- The Adafruit cloud server is free that's why it will may be stop.
- Need strong Wi-Fi connection,
- Need good quality sensor

7.3 Future Scope:

Initially I made a simple system that is automatically ON or OFF according to the soil moisture sensor data. My future plan is I add some feature in this system which is give some notification to farmer via mobile. Farmer also ON or OFF their motor from anywhere by using their mobile. I want to make this system more low coasted in future. I the future I try to make an android apps for this system so that user can easily control, notified, use, and maintain the system. I want to add the message system in this project. The message system send message to the user depend on the farming land condition. If the condition of the farming land is dray and land need water then the system will automatically start at the same time the system send a message to the user, the message show the recent condition of the system. Like your land need water, the motor start for irrigation and the % of the moisture, humidity, and temperature.

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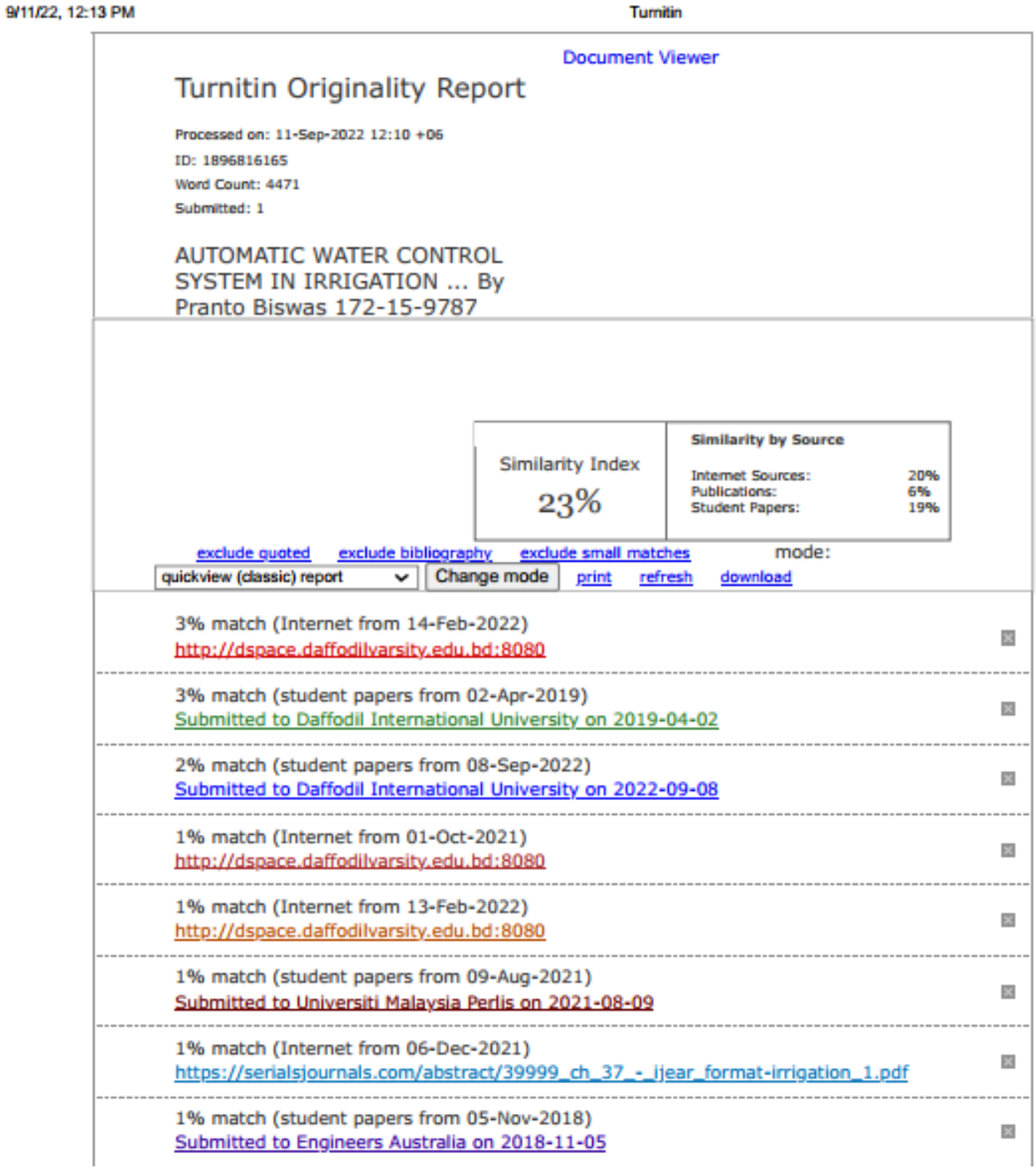

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