DEPARTMENT OF INFORMATION TECHNOLOGY &

COMMUNICATION

DIPLOMA IN INFORMATION TECHNOLOGY

DIGITAL TECHNOLOGY

TECHNICAL REPORT

SMART PLANT MONITORING AND WATERING SYSTEM

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ABSTRACT

The project of Smart Planting Monitoring and Watering Systems is make to use humidity, tempeture and wireless devise appBlynk to see the environmental temperature readings and the extent of water spraying according to the appropriate temperature for the oyster mushroom growth. It has three types of IoT devise tempeture sensors, seeing data on an LCD display as well as on a wireless device like a smartphone and 12V water pump.Other than that this project make to farmers who grow osyter mushrooms manually. The place that we aim to install this project is at mushrooms production house in Politeknik Seberang Perai. In addition, this project seeks to automatically spray water according to the ideal temperature for oyster mushrooms by reading the temperature in the smart appBlynk device. In the last section, the farmer may remotely monitor his mushroom crop and manage it in a way that saves him more time.

DECLARATION

We hereby declare that the technical report entitled “Smart Plant Monitoring and Watering System” is based on original work under supervision and guidance of Puan Rosmawati binti Jaafar except for citations and quotations which have been duly acknowledged. We also declare that it has not been previously and concurrently submitted for any other diploma or award at Polytechnic or other institutions.

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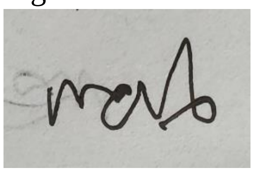

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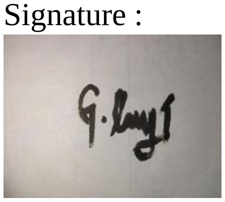

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CHAPTER 1

INDENTIFICATION

1.0 INTRODUCTION

The project's goal is to combine the Internet of Things (IoT) and Arduino to simplify how clients run their facilities. In this case, the client won't need to manually spray the mushrooms oyster with water. The client will also benefit from time savings. The client communicates with the device application (Blynk), which uses sensors placed around the mushrooms to update the current status of their surroundings. The sensors gather data about the environment, including temperature, humidity, and moisture in the soil, which is then shown on the user's smartphone. The user interface interacts with the user and enables them to look at a variety of environmental factors affecting the plant, including humidity, temperature, and moisture status.

The major goal of the proposal paper is to use the Internet of Things to accomplish the following objectives:

i. Monitor the humidity and temperature status of the mushrooms from a smartphone.
ii. Make the automatic water spraying system for oyster mushrooms.
iii. To maintain oyster mushroom growth consistently.

1.1 RESEARCH BACKGROUND

This project IoT allows the user to water fields and safeguard his crops from any location using a phone, tablet, and other devices. Arduino, which is linked with sensors and a node ESP32, is used to construct a smart DHT11 Sensor and 12V Water Pump. The model's basic operation relies on using an Arduino to store sensor data and then transmitting it to a Wi-Fi module. Through the Blynk app, the ESP32 refreshes data in a device. The most significant environmental component influencing mushrooms growth is proper temperature. Different mushrooms require different temperatures. Hardiness is the capacity of a mushrooms to appropriate temperature for the situation. Tender mushrooms are those that cannot with stand hot temperatures. In this article, we will be looking at how oyster mushrooms are prepared as seeds to be used in the processing of this IoT project. Because he is an oyster mushroom that does not need to be watered, it needs to be taken care of in a very special way.

1.2 PROBLEM STATEMENT

The issue that I discovered is that the farmers does not have a system in place to monitor humidity and local temperature by using wireless method. Water is necessary for oyster mushrooms to grow. It is significantly easier for users and cheaper to utilise DHT11 sensors to assess water levels.

As can be seen, both favourable and unfavourable results are conceivable if water level are not maintained. DHT11 sensor are crucial pieces of farming equipment because of this, less rely on tech that is more advanced. The majority of farmers continue to humidity and local temperature using traditional methods.

1.3 RESEARCH OBJECTIVE

This project's primary goal is to create a system that can track tempeture and humidity conditions. Before a full study was carried out we found that the tools available in the market today are not very expensive. This is due to the fact that the current system cannot be utilised automatically, there is no data display, and the best time to spray mushrooms depends on a temperature that is more symbolic.In addition, we make it simpler for farmers to see the data and show it in a clearer way, we also included an LCD screen display. We also have a poll asking farmers about their preferences so we may gather data and carry out this endeavour. As creators with innovative ideas, we must be astute enough to successfully apply them to our studies and endeavours.

1.4 PROJECT SCOPE

The goal of this project is to create a smart phone application that controls a system and gives farmers information. ESP-32 is used by the primary controller. The project's scope includes the following:

i. To provide smart system control for the phone that will tell the farmer about.

ii. Information on the temperature, humidity, and moisture content of the soil.

iii. Water supply based on the surrounding tempeture DHT11 sensors. iv.
To offer a user-friendly, cost-effective system.

1.5 PROJECT SIGNIFICANT

The goal of this project is to make it simpler for consumers to obtain and manage the enormous volumes of data produced by sensors. Data may be accessed in real time at any time and from any location, enabling end-to-end communication between all parties and live monitoring.

1.6 EXPECTED PROJECT EARNINGS

At the end of this project, the Smart Plant Watering and Monitoring System provides water spraying and environmental temperature data to the oyster mushrooms automatically with more effectiveness and the advantages of using IoT devices in the project.
The level of effectiveness can be measured through this IoT device through its own advantages. For example, using IoT electronic equipment automatically and being able to read the environmental temperature and the level of water shortage from this oyster mushroom.

1.7 CONLUSION

The summary of Chapter 1 explains how to use Smart IoT Devise and the benefits of oyster mushroom farming in an automatic process. Chapter 2 describes the literature review related to IoT devices. This chapter should explain the concepts or theories related to the title of the project being carried out.

CHAPTER 2

LITERATURE RESEARCH

2.0 INTRODUCTION

Chapter 2 explains the introduction to the literature review that is done in a true concept or theory and is used in relation to research such as journals, articles and others. This area of the oyster mushroom house is the place to be used as an IoT electronics place automatically. To make it easier to understand, if it is done manually it takes a relatively long period of time compared to automatic action, saving more time for spraying and better temperature care of this oyster mushroom

2.1 IoT DEVISE HISTORY

The Internet of Things (IoT) is the ability to have devices communicate with each other over the internet or other networks, tracking information remotely to provide feedback to help make decisions for commercial, industrial and residential purposes. This is usually done using sensors that connect to the back-to-base system.

2.1.1 EXAMPLE OF IoT DEVISE TYPES

2.1.2 Home Security

The key driver behind smart and secure homes is IoT. A variety of sensors, lights, alarms and cameras (all of which can be controlled from a smartphone) are connected via IoT to provide 24x7 security.

2.1.3 Activity Trackers

Smart home security cameras provide alerts and peace of mind. Activity trackers are sensor devices that can monitor and transmit key health indicators in real-time. You can track and manage your blood pressure, appetite, physical movement and oxygen levels.

2.1.4 Industrial Security and Safety

IoT-enabled detection systems, sensors and cameras can be placed in restricted areas to detect trespassers. They can also identify pressure buildups and small leaks of hazardous chemicals and fix them before they become serious problems.

2.1.5 Augmented Reality Glasses

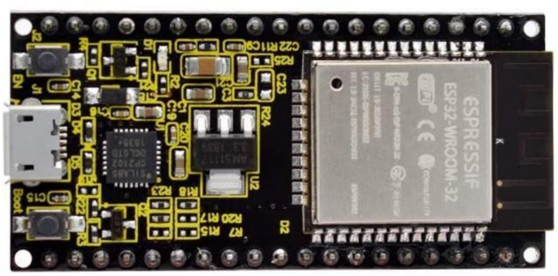
Augmented Reality (AR) glasses are wearable computer-enabled glasses that help you get extra information such as 3D animations and videos to the user's real-world scenes. The information is presented within the lenses of the glasses and can help users access Internet applications.

2.1.6 Motion Detection

Motion sensors can detect vibrations in buildings, bridges, dams and other large-scale structures. These devices can identify anomalies and disturbances in the structures that could lead to catastrophic failures. They can also be used in areas susceptible to floods, landslides, and earthquakes.

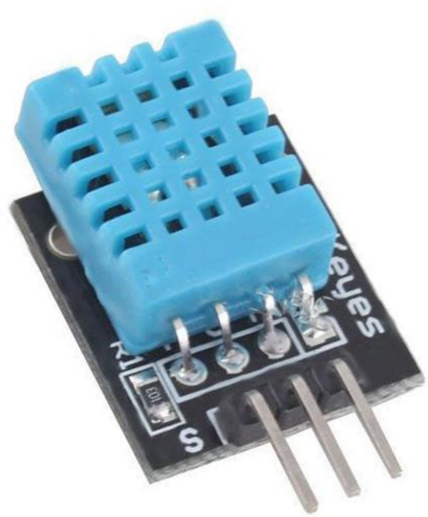
2.2 LITERATURE REVIEW

The findings on DHT21 sensors for oyster mushrooms and irrigation systems are briefly examined in this chapter. An analysis of the benefits and drawbacks of each term of this project will be done based on the literature review. With DHT11 sensors, a temperature sensor, and Wi-Fi modules, this project gives the impression that it is an Arduino-based Internet of Things (IoT) system. We'll talk about the application for gathering data. Oyster mushrooms practically meet all of our basic needs for living, but we are unable to provide theirs, such as water and unpolluted oxygen, and as a result, they cannot survive. The IoT-based smart plant watering and monitoring system, which senses the oyster mushrooms needs and has many flaws. It may have met the mushrooms needs for survival, but it also may have missed other equally important factors that should be avoided for the mushrooms survival, such as disease and climate change.



2.3 NODE MCU:

A low-cost System-on-a-Chip (SoC) called the ESP32 serves as the foundation of the opensource NodeMCU (Node MicroController Unit). The Espressif Systems-designed and -produced ESP32 has all of the essential components of a computer, including CPU, RAM, networking (WiFi), and even a contemporary operating system and SDK. This makes it a fantastic option for all types of Internet of Things (IoT) projects. The ESP32 is difficult to access and use as a chip, though. For the simplest operations, like turning it on or sending a keystroke to the "computer" on the chip, you must solder wires with the necessary analogue voltage to its pins. Additionally, you must programme it using low-level machine instructions that the chip can understand.



2.4 DHT11:

DHT11 is a high performance temperature and humidity sensor, providing accurate measurement, low power consumption, long distance data transmission, automatic calibration and long life. It is perfect for projects that require measurement of temperature and humidity such as greenhouse and portable weather station that provides precise information about the environment. The sensor has small size making it to be easily integrated into the project.

2.5 LCD 16X2 DISPLAY:

This is LCD 16X2 Display Ardunio Uno. With this module, you can see what humidity percentage and soil moisture level for this mushrooms oyster. The one probes on the display act as variable resistors. Use it in a home automated watering system, hook it up to IoT, or just use it to find out when your mushrooms oyster needs some sparkling water to reduce hight humidity to this mushrooms. The LCD Display consists of two probes which are used to measure the volumetric content of water and tempeture of humidity.

2.6 DC WATER PUMP 12V:

A pump is essentially a tool that moves fluid through mechanical action (liquids). A pump uses a rotational or reciprocating mechanism that primarily performs mechanical work while also requiring some energy. Pumps come in a variety of sizes, from smaller ones used in medicine to larger ones used in businesses.

2.7 RELAY :

Relay A copper wire is coiled around a core inside a relay (the coil). The switch's armature remains in contact with the normally closed (NC) terminal under typical circumstances. However, when voltage is provided through the coil, an electromagnetic field is created and the coil begins to behave like a magnet, attracting the armature to the usually open circuit (NO). At its most fundamental, relays are just that. More than that, there are numerous other sorts of relays, including solid state and thermal relays, each with a unique functioning method but serving the same general function. Here, this component is used to regulate the flow of a mini-dc pump that automatically waters plant.

2.8 ADAPTER 12V :

An AC adapter, AC/DC adapter, or AC/DC converter is a type of external power supply, often enclosed in a case similar to an AC plug. Other common names include wall wart, power brick, wall charger, and power adapter. Adapters for battery-powered equipment may be described as chargers or rechargers (see also battery charger). AC adapters are used with electrical devices that require power but do not contain internal components to derive the required voltage and power from mains power. The internal circuitry of an external power supply is very similar to the design that would be used for a built-in or internal supply. External power supplies are used both with equipment with no other source of power and with battery-powered equipment, where the supply, when plugged in, can sometimes charge the battery in addition to powering the equipment.

2.9 SOFTWARE DESCRIPTION

The programming process-using NODEMCU Esp32 software to upload coding into Arduino uno.

```
#define BLYNK_TEMPLATE_ID "TMPLrPrhm2zF"
#define BLYNK_DEVICE_NAME "pk humidity and temp"
#define BLYNK_AUTH_TOKEN "DhZtDN2xf8HIf96U06KFjffmRzhitqaU"

#define BLYNK_PRINT Serial
#include <WiFi.h>
#include <WiFiClient.h>
#include <BlynkSimpleEsp32.h>
#include "DHT.h"
#include <Wire.h>
#include <LiquidCrystal_I2C.h>

#define DHTPIN 15
#define DHTTYPE DHT11
#define WATERPUMP 23
DHT dht(DHTPIN, DHTTYPE);
LiquidCrystal_I2C lcd(0x27, 16, 2);

char auth[] = "DhZtDN2xf8HIf96U06KFjffmRzhitqaU";
char ssid[] = "mad";
char pass[] = "muhdmeow";

int h;
int t;
int AUTO = 0;

BLYNK_WRITE(V0) {
 int buttonState1 = param.asInt();
  if (buttonState1 == 1){
    AUTO = 1;
    digitalWrite(WATERPUMP,LOW);
    lcd.setCursor(0,1);
    lcd.print("WATERPUMP: ON  ");
  }
  else if (buttonState1 == 0){
    AUTO = 0;
    digitalWrite(WATERPUMP,HIGH);
  }
}

void setup()
{
  Serial.begin(115200);
  Blynk.begin(auth, ssid, pass);
  dht.begin();
  lcd.begin();
  lcd.backlight();
  pinMode(WATERPUMP,OUTPUT);
  digitalWrite(WATERPUMP,HIGH);
}

void loop()
{
  Blynk.run();
  h = dht.readHumidity();
  t = dht.readTemperature();
  Serial.println("Temp: " + String(t) + "  C Humi:" + String(h) + "% ");
  lcd.setCursor(0,0);
  lcd.print("T:" + String(t) + "C H:" + String(h) + "%   ");
  if(AUTO == 0){
     if(t >= 35){
        lcd.setCursor(0,1);
        lcd.print("WATERPUMP: ON  ");
        digitalWrite(WATERPUMP,LOW);
        delay(500);
     }
     else{
        lcd.setCursor(0,1);
        lcd.print("WATERPUMP: OFF ");
        digitalWrite(WATERPUMP,HIGH);
        delay(500);
     }
  }
}
```

Figure 1. Software Description

3.0 CONCLUSION

Overall Chapter 2 obtained is a test that will be made referring to previous research sources to complete this project that can be done. In addition, some information has been taken from these types of IoT and the IoT implementation method used to identify its functions. Finally, the implementation of this smart plant watering and monitoring system project makes it easier for the process of automatically spraying water and seeing the temperature of the environment in the oyster mushroom house.

CHAPTER 3
METHODOLOGY/DESIGN

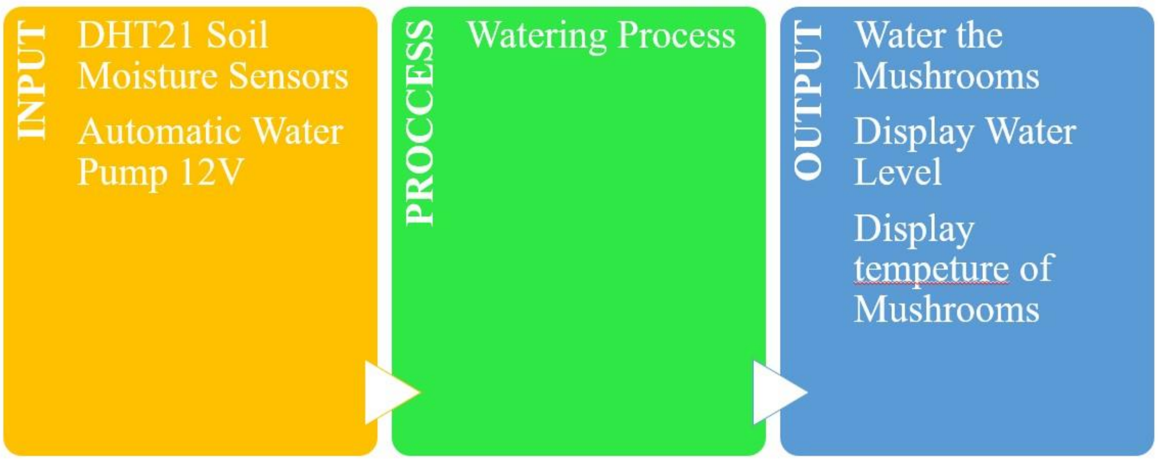
4.0 INTRODUCTION

The success of this project is to ensure whether this method of smart plant watering and monitoring system is able to have a good impact or effect on oyster mushroom farmers or the opposite. Next, the use of Smart Plant Watering and Monitoring Systems is influenced by several factors such as the installation of the IoT device circuit, the preparation of accurate coding, the type of wireless control device and the type of display on the smartphone used and the type of model used to implement this project.

Therefore, this is because, in ensuring that the Smart Plant Watering and Monitoring System project can function properly and it also needs to be monitored through smart wireless devices systematically and from time to time. With this, the Smart Plant Watering and Monitoring System project can last for a long time while also saving costs and time. In fact, can cultivate other farmers to use Smart Devise IoT which saves the production cost of more money and daily life time.

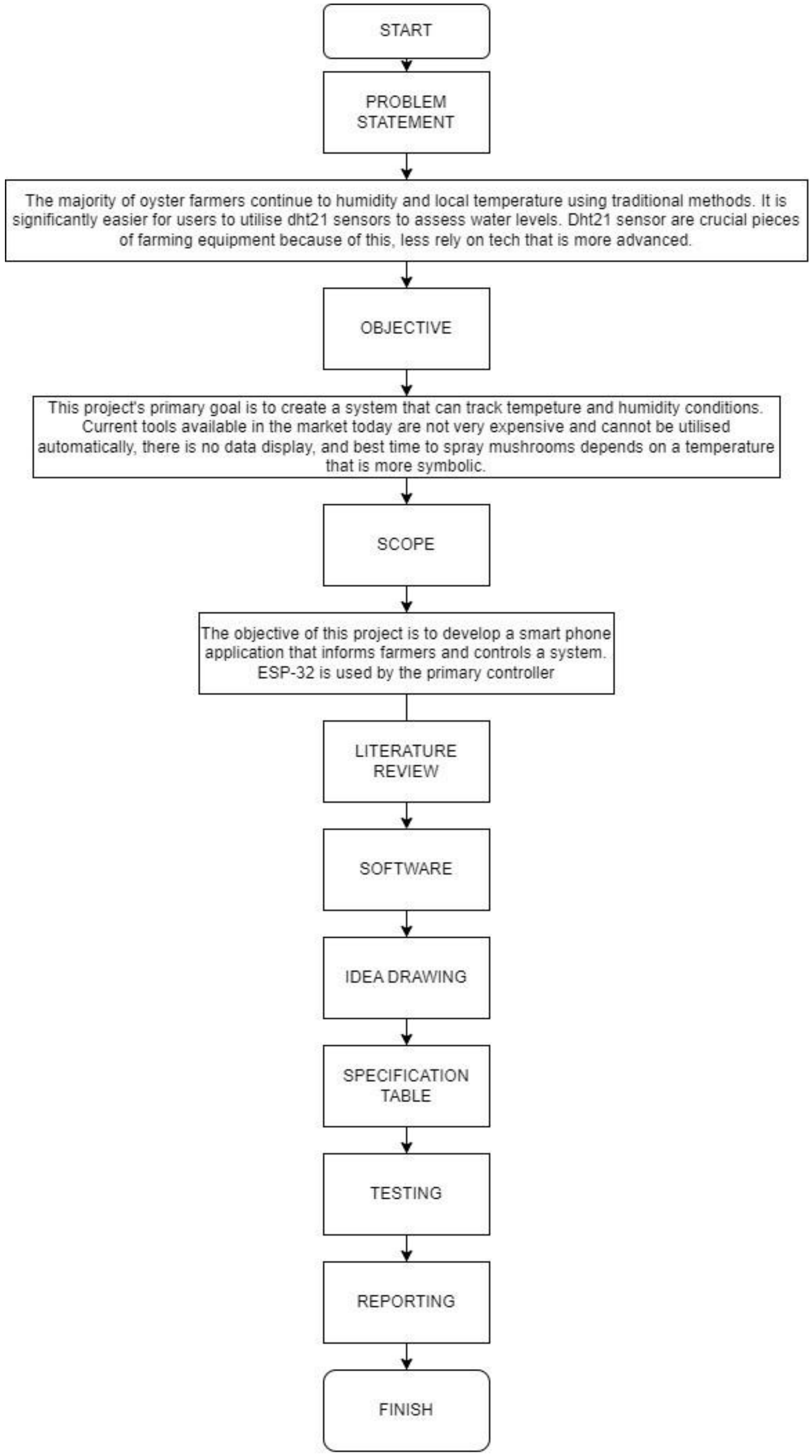
4.1 METHODOLGY

This project was created to keep track of, care for, and secure the oyster mushroom in the mushrooms house or garden vendor. Any mushrooms in the mushrooms house will serve as the testing mushroom oyster for this project. In this case, it gives you the ability to adjust the monitor IoT-based projects from anywhere. To gather data, this system uses a variety of sensors, including dht11 sensors, temperature sensors, and automatic water pump.



This project will use **Prototyping Modelling** for the development of the Smart Irrigation for Mushrooms. The prototyping model is a systems development method in which a prototype is built, tested and then reworked as necessary until an acceptable outcome is achieved from which the complete system or product can be developed. This true prototype will be used to complete the final product. During develop the prototype, more feature can be added and improve the function of the system. This will be continuing until all the suitable feature and function is installed in the product. The advantages using this method is it can detect error much earlier and can fix the error as soon as possible. This allow developer to fix any error before delivering it as final product or fix it before reach another phase. Another advantages of using this method is that it saves time. This in terms of finding the error and fix it quickly at early stage 7 rather than discover error at the last stage at development which can cost time just to find the error. By using a prototyping model, the smart water features can be improved.

4.2 FLOW CHART



i. Analyze Requirement Gathering:

For prototyping technology model is started implemented with the requirements analysis and requirements of the system that are defined in detail. The research on the irrigation systems, sensor, and NodeMCU32 kit to be implemented in the system are done in this phase. Then, the full document for this system is prepared.

ii. Design for this Project:

When the requirement of the system is identified, the preliminary design for the system is created. In this phase design for the prototype is not details and only includes important aspects of the system, it only gives an idea of the system to the user. For every meeting stage, the technology design has either an upgrade or downgrade depending on the user.

iii. Testing:

When all the module has been implemented into a single system. The testing then will be carried out to identify any error that may occur. This phase is crucial as we would not want any error to surface during the real deployment.

4.3 IDENTIFYING PROBLEM

In this preliminary study, before the start of the project we identified the problems faced by oyster mushroom growers located in Seberang Perai Polytechnic. The main problem we got at the mushroom house is that this mushroom house does water spraying manually and does not have electronic items in the place. This is why, the initial planning of our project is to do Smart Watering Plant and Monitoring systems based on IoT in the oyster mushroom house. With this plan in place, these works need to be carried out within 16 weeks and well organized.

4.4 PROVIDING PROJECT EQUIPMENT

The provision of equipment connected to the project should be taken care of so that there are no accumulated difficulties or errors in the acquisition of project items that need to be executed. One example of a problem that has to be addressed carefully is the issue of IoT electronic equipment being utilised incorrectly and unneeded goods costing money to the project.

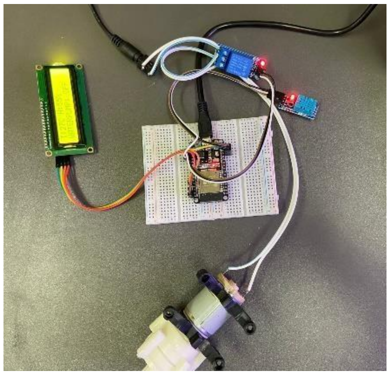


Figure 2. A complete overview of IoT electronics.

4.5 MAINTENANCE INSPECTION

The troubleshooting phase is the last phase to complete this project. For example, if there is a display problem on this IoT LCD, this matter needs to be re-troubleshooted in the coding blynk app, whether after the 16-week period has expired or not. Oyster mushroom farmers need to report if this kind of thing happens and do a troubleshooting to solve the problem.

Figure 3. In this diagram, identifying the problem of not being able to connect to the ESP32 board.

4.6 CONCLUSION

Therefore, in the initial stage, identify the IoT project items, troubleshoot problems, installation sessions and testing failures in this project as well as know the information to describe more clearly in this project. After this analysis is carried out, it is important to make a summary or conclusion on the results of this project whether the Smart Watering Plant and Monitoring System project is effective or not.

CHAPTER 4
RESEARCH AND DISCUSSION

5.0 INTRODUCTION

In this chapter will discuss about result and discussion. Through this chapter can also identify problems and solve them. For this Smart Plant Watering and Monitoring System we are using Block diagram, Schematic circuit and Final result. Also, in this project we do some research and discussion about IoT product. The last one is the cost planning listed by our project.

5.1 BLOCK DIAGRAM

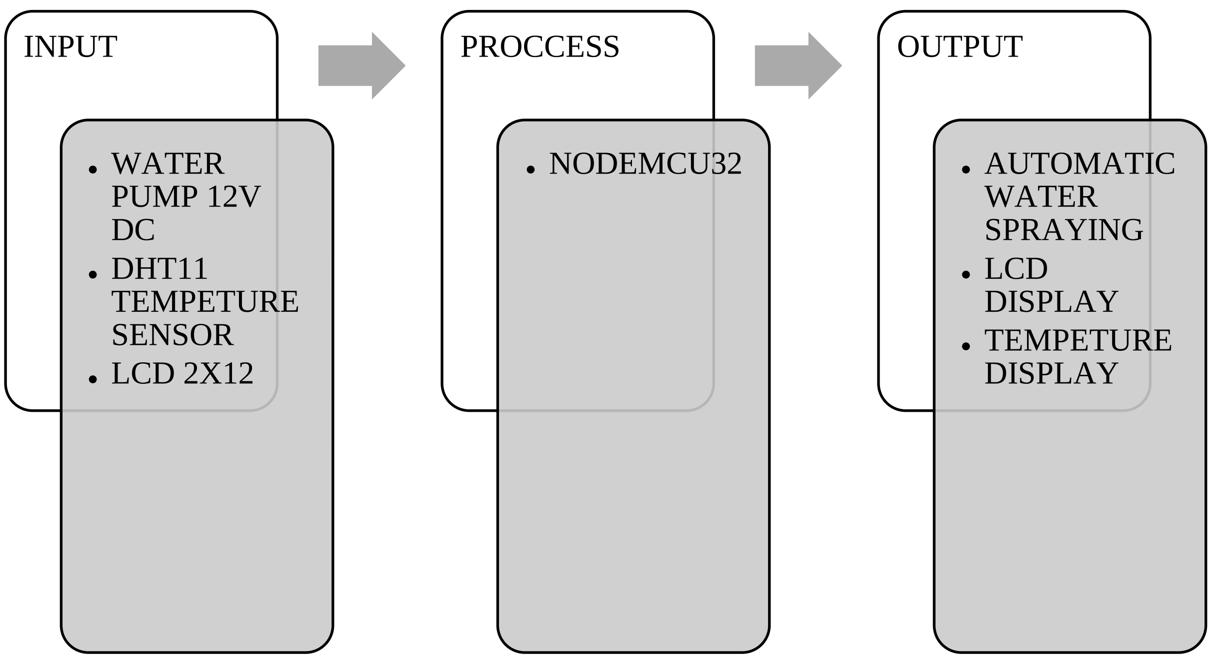


FIGURE 4.1 BLOCK DIAGRAM.

5.2 SCHEMATIC CIRCUIT

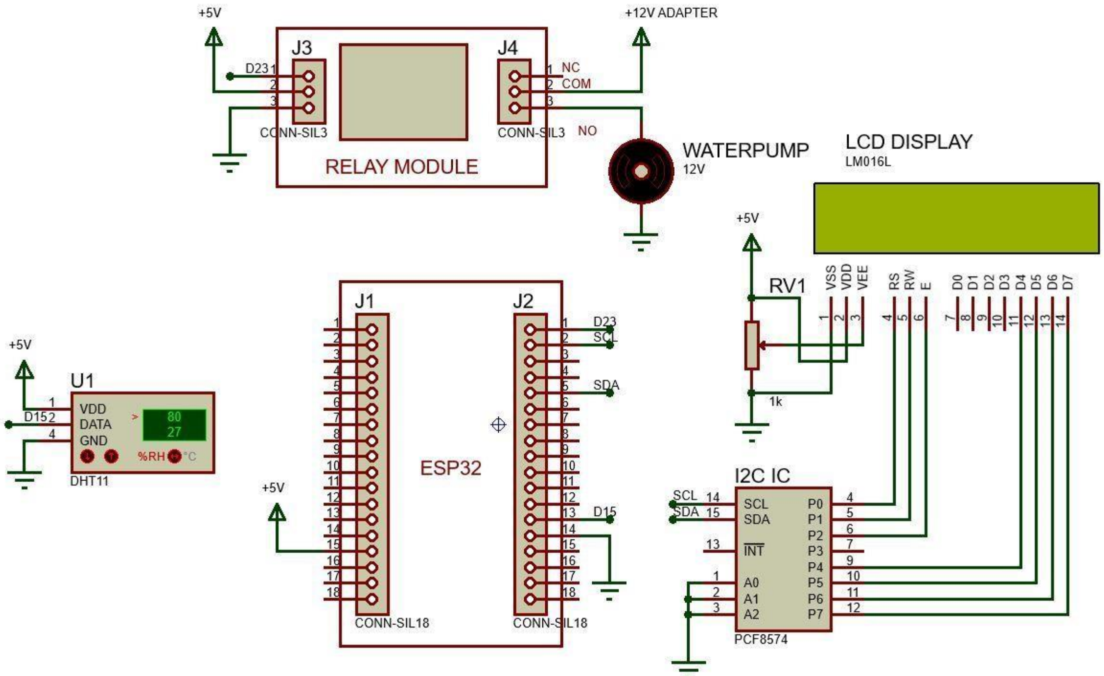
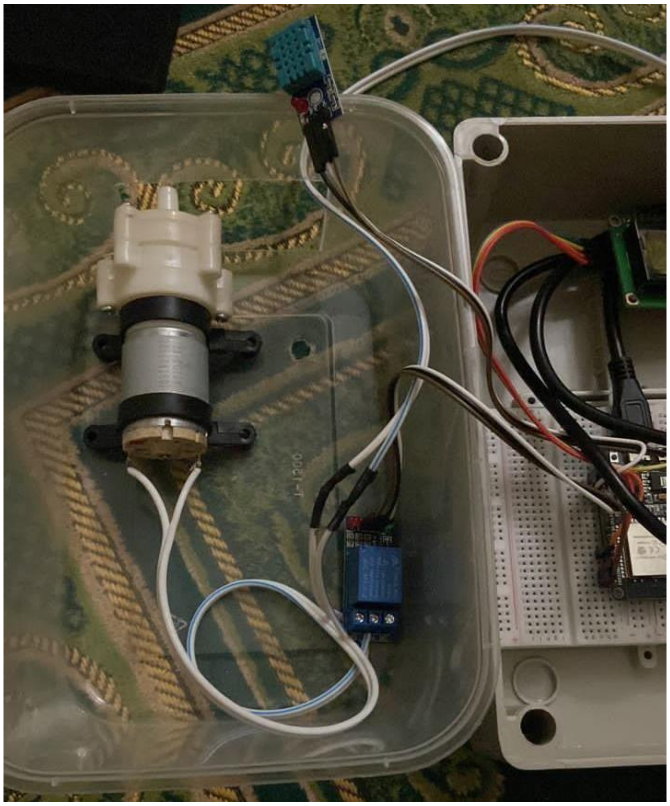


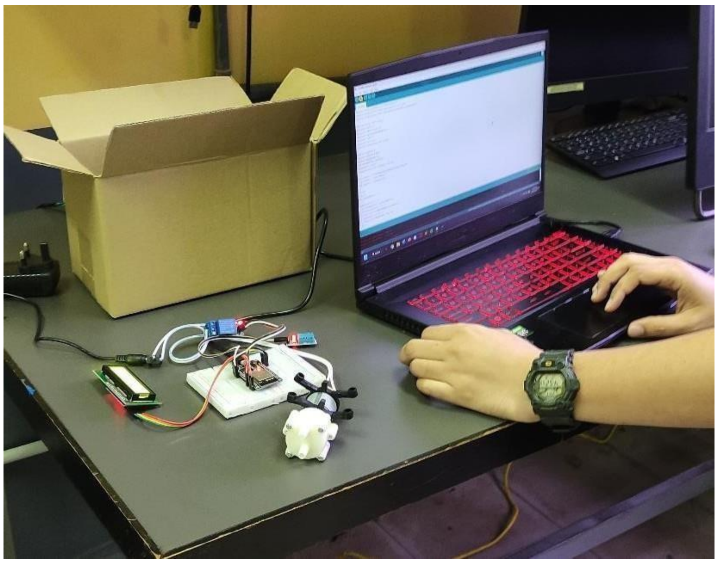
FIGURE 4.2 SCHEMATIC PROJECT CIRCUIT

5.3 FINAL RESULT

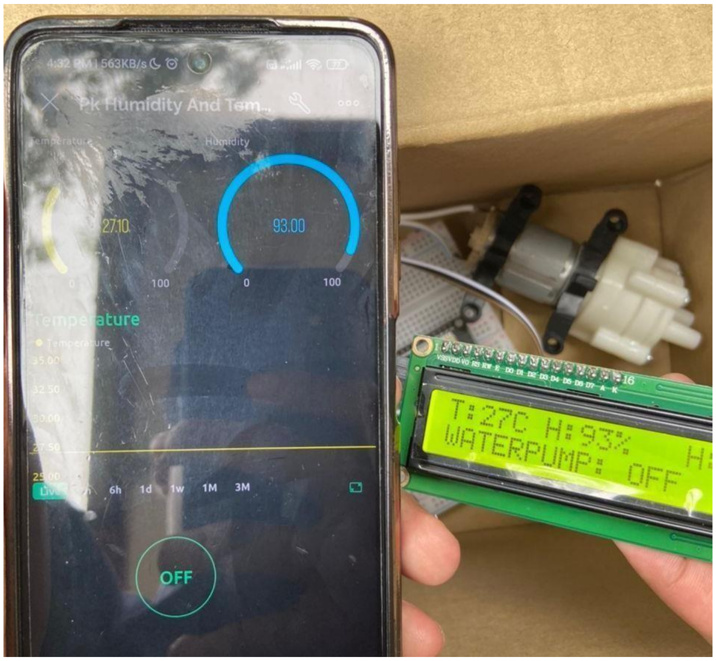
i. Product installation process



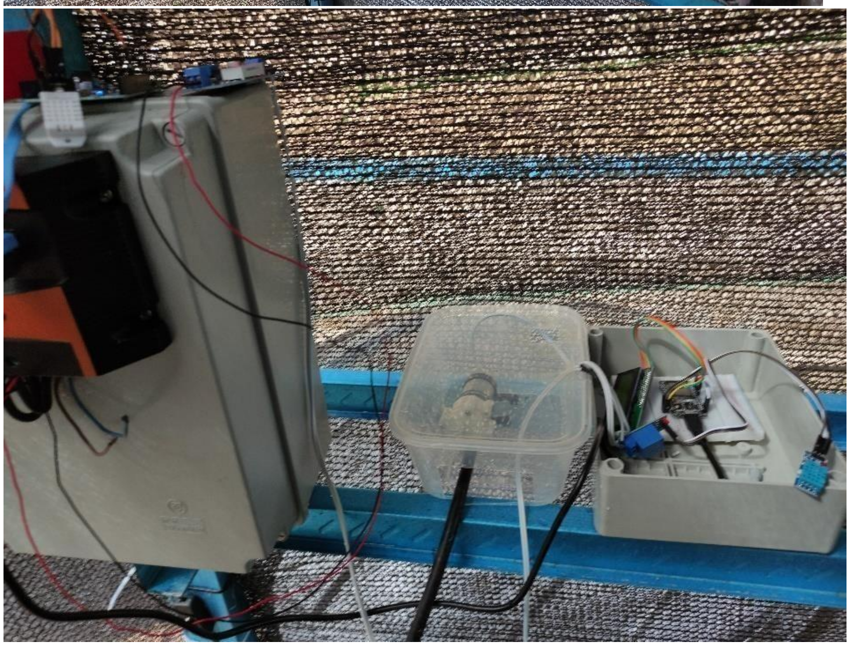
ii. Connecting the coding to esp32



iii. Connect Blynk apps to esp32



iv. Installation of project items at the place of oyster mushrooms



v. Meeting with the process owner at the oyster mushroom place

5.4 RESEARCH

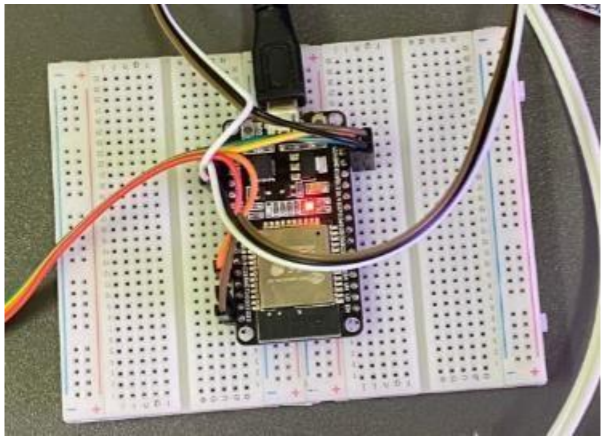


FIGURE 5. NODEMCU ESP32

The microcontroller created by Espressif (Communicative) Systems goes by the moniker of ESP32 Dev Module. This microcontroller is capable of carrying out WIFI-related tasks. Although it is frequently used as a WiFi module, it may also be applied to other types of communication systems. We will use ESP32 Dev Module modules in this lesson, which come in a variety of sorts. One of the most popular DHT temperature sensors, the DHT11 digital temperature sensor, has a relative humidity accuracy of +/- 3% and a comparatively high temperature measurement precision of 0.5oC in 0.1oC increments. It only has three wires total—two for power and one for ground—so connecting it to a microcontroller just requires one digital pin.

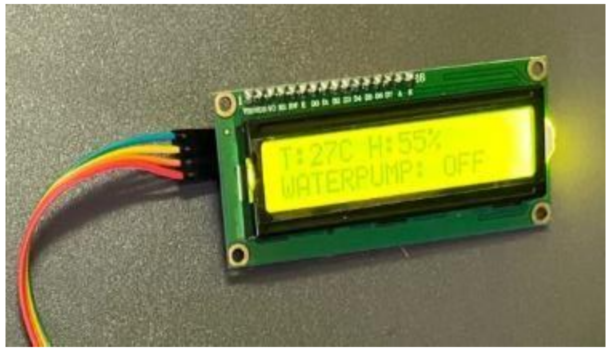


FIGURE 5.1.1 LCD

The LCD with a 16 x 2 display used by Arduino is most frequently utilised in embedded projects. 16 Columns and 2 Rows are represented by the 162 Display LCD Module. For various screen sizes, there are several more combinations available, such as 8 x 8 or 10 x 10 or 16 × 16. The Arduino 16x2 LCD Display Module contains an I2C interface and a 2-line LCD screen with 16 characters per line. It shows two lines of 16 characters each, with white characters on a blue backdrop. This implies that we may utilise VCC, GND, SDA, and SCL as the four pins for the display.

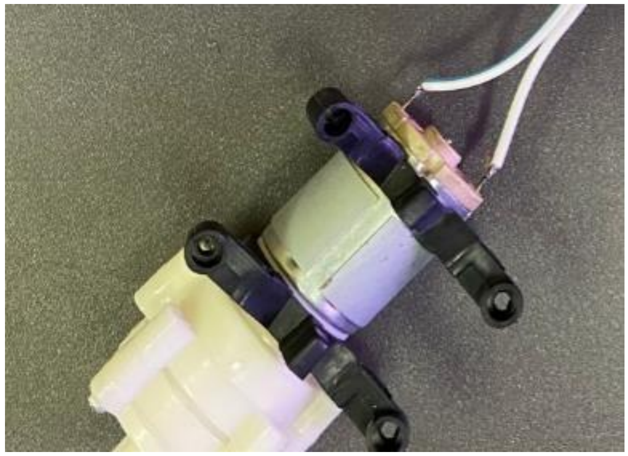


FIGURE 5.1.2 12V WATER PUMP

In this project that calls for the transfer of water from one location to another should use this DC612V Pump. The pump operates extremely silently when pumping a liquid, with a sound level of sub 30db. Although the pump is fairly loud when pumping air, it is also capable of doing so. The pump contains an internal filter and a suction cup that may be used to firmly attach it to flat surfaces.

FIGURE 5.1.3 RELAY

The Single Channel Relay Module is a handy piece of equipment that may be used to manage high voltage, high current loads such AC loads, motors, solenoid valves, and lights. It is made to communicate with several microcontrollers, including Arduino, PIC, and others. With a screw terminal, the relays' terminals (COM, NO, and NC) are removed. Additionally, an LED is included to show the relay's status.

FIGURE 5.1.4 ADAPTER 12V

An electrical circuit known as a DC power supply 12v transforms ac voltage into dc voltage. The main components of a power adapter are transformer, rectifier, filter, and regulator circuits. An electrical device known as a power supply provides electricity to an electrical load. A power supply's main job is to transform electrical current from a source into the proper voltage, current, and frequency for a load. DC power supply 12v Because of this, power supplies are sometimes known as electric power converters. While some power supplies are integrated into the load appliances they power, others are independent freestanding pieces of equipment.

5.5 TEST RUN

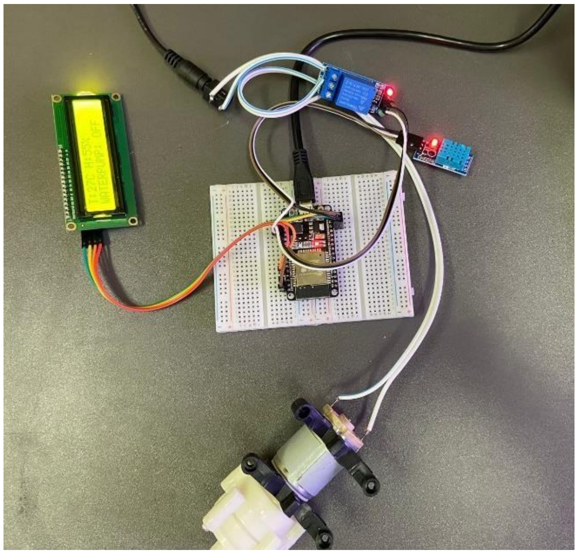


FIGURE 5.1.5 RUN TEST

With the help of the new platform Blynk, you can quickly design interfaces for managing and keeping an eye on your hardware projects from an iOS or Android mobile device. After installing the Blynk programme and placing buttons, sliders, graphs, and other widgets on the screen, you may create a project dashboard. The widget may be used to display sensor data.

There are probably hundreds of instructions available for whatever project you're working on, but designing the software interface is still difficult. Contrarily, the software side of Blynk is even simpler than the hardware. When engaging with simple activities, Blynk excels.

5.6 COST PLANNING

No.	Equipment	Cost(RM)
1.	NodeMCU ESP32	40.00
2.	Breadboard 8.5 x 5.5cm	2.90
3.	DHT21 Sensor (Tempeture Air)	10.00
4.	USB Micro B Cable	2.50
5.	Single Channel 5V Relay Breakout Board	8.90
6.	Box	10.00
7.	R385 DC12V Diaphragm Water Pump	20.00
8.	Low Pressure Misting Nozzles	1.50
9.	AC DC Adapter 12V	10.00
10.	20CM Jumper Wire	2.50
	TOTAL	108.30

This is a list of the total cost of IoT components allocated to implement the IoT circuit installation project. Each of these items has been carefully prepared to ensure that there are no unused items and no wastage.

CHAPTER 5
CONCLUSION AND SUGGESTION

5.0 INTRODUCTION

For this chapter, the decisions made are based on all the results obtained from the experiments conducted and the discussions in the previous chapters. In this chapter as well, related matters are about the objectives of the study and also the recommendations for the study conducted. Finally, the conclusion has been made for this experiment.

5.1 CONCLUSION

The main objective of this implemented project is to help farmers who sow block oyster mushrooms so that they can be seen through Smart Watering and Monitoring more effectively and follow the temperature circulation in the oyster mushroom house area. With this, the automatic watering process can be seen with a wireless smartphone for the farmers. This project can also help farmers monitor this oyster mushroom with more efficient surveillance. After the installation of this project is complete, the farmers can see the temperature and humidity in the blynk app.

Additionally, users have the option to create a watering schedule by their preferences, which will minimize manual human contact and water the oyster mushrooms automatically by evaluating the DHT11 sensors. The smartphone app that manages the IoT gadget allows users to automatically spraying water the mushrooms as well. The IoT device's unique feature allows it to determine how healthy a mushrooms oyster is by examining the surrounding temperature, and the humidity.
Finally, this project can be done successfully.

5.2 PROPOSOL

This "SMART PLANT WATERING AND MONITORING SYSTEM" can indeed be proven to work well and efficiently. However, improvements to the research carried out can be implemented with suggestions. This will surely help the oyster mushroom farmers as much as possible in the care process at the mushroom house located in the Seberang Perai Polytechnic.

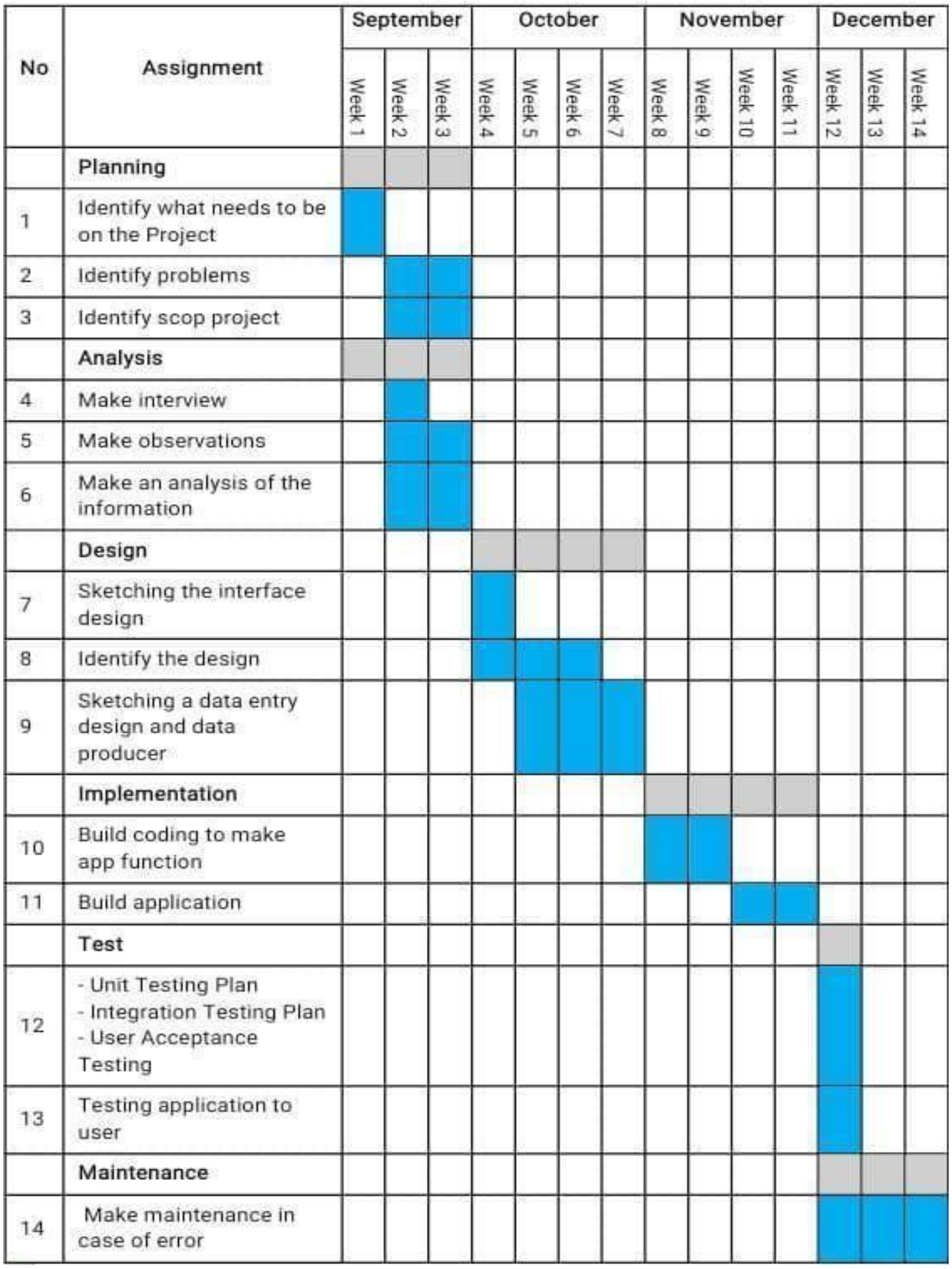
The following are matters that can be suggested to further improve the project study that will be carried out on the Smart Plant Watering and Monitoring System to find out the level of effectiveness:

i. Added a motion sensor to observe pests such as mice, squirrels and other pests.
ii. Installing a sound buzzer for the presence of elements of pest movement in this oyster mushroom house.
iii. Installing lights using an IoT device for illumination at night and can be controlled manually on the Blynk App device.

5.3 SUMMARY

The results of the research that has been done on this Smart Plant Watering and Monitoring System can be concluded that it has achieved its objective which can be seen in the blynk app system and help this oyster mushroom farmer successfully. In addition, the installation of this IoT kit has been proven and successful for oyster mushroom farmers in the mushroom house.

5.4 GANT CHART



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APPENDIX

```
#define BLYNK_TEMPLATE_ID "TMPLrPrhm2zF"
#define BLYNK_DEVICE_NAME "pk humidity and temp"
#define BLYNK_AUTH_TOKEN "27B7HglV6NYVrAsR0H8xeqa9XifLbTs6"

#define BLYNK_PRINT Serial
#include <WiFi.h>
#include <WiFiClient.h>
#include <BlynkSimpleEsp32.h>
#include "DHT.h"
#include <Wire.h>
#include <LiquidCrystal_I2C.h>

#define DHTPIN 15
#define DHTTYPE DHT11
#define WATERPUMP 23
DHT dht(DHTPIN, DHTTYPE);
BlynkTimer timer;
LiquidCrystal_I2C lcd(0x27, 16, 2);

char auth[] = "27B7HglV6NYVrAsR0H8xeqa9XifLbTs6";
char ssid[] = "mad";
```

```
char pass[] = "muhdmeow";


int h; int t; int
relayState1 = 1;


BLYNK_WRITE(V0) {
 int relayState1 = param.asInt();   if
(relayState1 == 0){
digitalWrite(WATERPUMP,relayState1);
    lcd.setCursor(0,1);
lcd.print("WATERPUMP: ON  ");
  }    else if (relayState1 ==
1){
    digitalWrite(WATERPUMP,HIGH);
  } } void
sendSensor()
{   float h = dht.readHumidity();
float t = dht.readTemperature();
if (isnan(h) || isnan(t)) {
    Serial.println("Failed to read from DHT sensor!");     return;
    }
  Blynk.virtualWrite(V5, h);
  Blynk.virtualWrite(V6, t);
```

```
}

void setup() {
Serial.begin(9600);
delay(1000);
Blynk.begin(auth,ssid,pass);
dht.begin();   lcd.begin();
lcd.backlight();
  pinMode(WATERPUMP,OUTPUT);
  digitalWrite(WATERPUMP,relayState1);
timer.setInterval(1000L, sendSensor);
}

void loop() {
Blynk.run();
timer.run();
h =
dht.readHum
idity();   t =
dht.readTem
perature();
```

```
  Serial.println("Temp: " + String(t) + "  C Humi:" + String(h) + "% ");
lcd.setCursor(0,0);   lcd.print("T:" + String(t) + "C H:" + String(h) +
"%   ");
{      if(t >= 30){          lcd.setCursor(0,1);
lcd.print("WATERPUMP:     ON          ");
digitalWrite(WATERPUMP,LOW);
        delay(500);
     }      else{          lcd.setCursor(0,1);
lcd.print("WATERPUMP: OFF ");
digitalWrite(WATERPUMP,HIGH);
        delay(500);
     }
  }
}
```