INTERNSHIP REPORT

Submitted by

JAIVANT S.B 717822P220

in partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

KARPAGAM
COLLEGE OF ENGINEERING
Rediscover | Refine | Redefine
(Autonomous)

ANNA UNIVERSITY, CHENNAI

MAY 2024

KARPAGAM
COLLEGE OF ENGINEERING
Rediscover | Refine | Redefine
(Autonomous)

BONAFIDE CERTIFICATE

This is to certify that the **Internship Report** submitted by **JAIVANT S.B (REG. NO: 717822P220)** is work done by her and submitted during 2023 – 2024 academic year, in partial fulfillment of the requirements for the award of the degree of **BACHELOR OF ENGINEERING in COMPUTER SCIENCE AND ENGINEERING**.

Department Internship Coordinator **Head of the Department**

Certified that the candidate was examined in the viva-voce examination held on ………………….

…………………….. ……………………..

(Examiner 1) (Examiner 2)

INTERNSHIP CERTIFICATE

{Code Clause};

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To Whom So IT May Concern

Date - 01 / 06 / 2024

This is to certify that **JAIVANT S B** ,pursuing Computer Science **KARPAGAM COLLEGE OF ENGINEERING** is working as an intern with CodeClause from the period **May-2024 To June-2024**.

During this period he handled **INTERNET OF THINGS INTERN** position.

During the course of the Internship,JAIVANT S B has shown a great amount of responsibility, sincerity, and a genuine willingness to learn and zeal to take on new assignments and challenges. In particular, his coordination skills and communication skills are par excellence and his attention to details is impressive

We wish all the very best for your future.

with regards,

CodeClause

MSME

MICRO, SMALL & MEDIUM ENTERPRISES

Certificate No - CC-CL81735

ACKNOWLEDGEMENT

My profound thanks to our Management, our beloved Principal **Dr. V. KUMAR CHINNAIYAN**. who happens to be a striving force in all our endeavors.

I feel immense pleasure in expressing my humble note of gratitude **Dr. D. PRABAKAR**, Head of the Department, Computer Science and Engineering, for providing an opportunity, encouragement, and suggestions to make the internship successful.

I express my sincere thanks to my Mentors **Dr. V. VIGNESH** Associate Professor and **Dr.A.S.MUTHANANTHA MURUGAVEL** Professor, Department of Computer Science and Engineering, who provided me with the necessary guidance and encouragement.

I would like to thank to **Code Clause** for giving me the opportunity to do an internship within organization. Although quite short, for me this was a great experience I can learn from. It helped me to explore my skills.

Without the help and support of all the mentioned people, I may not be able to fulfill my internship and learn different things. I would like to thank all those people for their valuable contribution and proper guidance throughout my internship period.

Finally, I must acknowledge with due respect the constant support and patience of my parents

ABSTRACT

Agriculture, a cornerstone of the global economy, faces increasing challenges such as climate change, resource scarcity, and the need to feed a growing population. Leveraging the Internet of Things (IoT), this paper presents a comprehensive smart agricultural system designed to address these challenges by enhancing productivity, efficiency, and sustainability in farming practices.

The proposed system integrates a network of IoT devices, including soil moisture sensors, temperature and humidity sensors, light intensity sensors, and automated irrigation controllers. These devices continuously monitor critical environmental parameters and transmit data to a centralized cloud platform. Advanced data analytics and machine learning algorithms process this data to generate real-time insights and recommendations for optimal farm management.

The agriculture quarter is undergoing a significant transformation propelled by means of improvements in technology, specifically the Internet of Things (IoT). This paper presents a comprehensive evaluation of a Smart Agricultural System (SAS) empowered via IoT technologies, aimed toward improving agricultural productivity, sustainability, and aid efficiency.

The proposed system integrates numerous IoT gadgets along with sensors, actuators, drones, and self-sufficient cars, interconnected thru wi-fi networks. These gadgets accumulate actual-time records on critical parameters such as soil moisture, temperature, humidity, crop increase levels, and environmental conditions. The accrued information is processed using superior analytics techniques which include machine learning algorithms and records mining to derive actionable insights.

Key features of the System include:

Precision Irrigation Management:

Soil Moisture Sensors: Measure soil moisture levels in real-time to ensure optimal water delivery.

Automated Irrigation Controllers: Adjust water supply based on sensor data, crop needs, and weather conditions, reducing water wastage and enhancing crop health.

Environmental Monitoring: Temperature and Humidity Sensors: Continuously monitor ambient conditions to maintain ideal growing environments and prevent disease and pest infestations.

Light Intensity Sensors: Track sunlight exposure to optimize plant growth and development.

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WEEKLY ACTIVITIES

WEEK	ACTIVITIES	DESCRIPTION
May 6-11	**Sensor Deployment**	Completed installation of soil moisture sensors in 5 additional fields. Installed temperature and humidity sensors in the greenhouse section. Set up light intensity sensors across two crop zones.
May 13-18	**Data Collection and Transmission**	Successfully configured the wireless sensor network for seamless data transmission. Began continuous data collection from newly installed sensors.
May 20-25	**Mobile Application Development**	Enhanced the user interface to provide more intuitive data visualization. Implemented real-time alerts for critical conditions (e.g., low soil moisture, high temperature).
May 27-31	**Data Analytics and Machine Learning**	Developed initial versions of predictive analytics models for weather forecasting and irrigation scheduling. Started testing machine learning algorithms for pest and disease detection.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Internet of Things (IoT) is the interconnection or network of physical devices that is interrelated computing devices, digital and mechanical machines, people or animals, objects that can sense, accumulate and transfer data over web without any human involvement. Everything is provided with unique identifier. It is a progressed examination and mechanized frameworks which uses detecting, organizing, enormous information and man-made consciousness innovation to convey total framework for an administration. Basically, loT is about extending the power of internet beyond smart phones and computers.

IoT has changed today's world. Smart cities, smart car, smart homes everything around us can be turned into a smart device with the help of loT. It also has applications in agriculture, business sectors, healthcare, transport and logistics.

1.2 Iot in Agricultural

Internet of Things has capacity to transform the lives of people in the world in an efficient manner. The ever growing population would touch more than 3 billions in few years. So, to feed such an immense population, agriculture industry need to embrace IoT. The demand for more food has to address challenges that include excessive climate conditions, weather change and different environmental affects that results from farming practices.

1.3 Structure of IoT in Agriculture

Basically this system structure consists of 3 layers that are sensor layer, transport layer application layer and the functions of these layers are below

1) Sensor layer: One of the challenge of the sensor layer is to obtain automated and real time transformations of the figures of actual world agricultural manufacturing into digital transformation or information which could be processed in virtual world

through different or various means.

The data that they collect are

- Sensor information- Humidity, temperature, gas concentrations, pressure etc.
- Products information- name, model, price and features.
- Working condition apparatus etc. - operating parameters of different equipment’s,
- Location information

The major challenge of Information layer is to mark diverse kinds of information or data and gathering the information and marked information in the actual world by means of techniques of sensing, after which remodels them for processing into digital information. This sensor layer includes some strategies- RFID tags, cameras, two dimension code labels, sensor networks.

2) **Transport layer-** This layer's task is to acquire and summarize the data of agriculture acquired from the above layer for processing. It is believed as the nerve centre of lot. This layer includes the combination of telecommunication management centre and also internet network, information centre, smart processing centres.

3) **Application layer-** The function of this layer is to analyse and process the information collected for the cultivation of digital awareness of actual world. It is considered as a fusion of loT and agricultural market intelligence.

1.4 MOTIVATION

Different kind of problems faced by the farmers motivated us for the recommended system that are: the Indian farming is on the hitch because of the limited technical know how of the best and efficient agricultural practices and moreover they are still dependent on conventional methods of agriculture that leads to lesser productivity of crops. So by using upcoming technology the productivity of crops can be maximized at minimal cost This also reduces burden of taking up of heavy loans on farmers which they have incurred on themselves in order to sustain their livings or to get good yields of their crops. Apart from these issues scarcity of resources also adds up in their problem causing hindrance or stopping framers from cultivating and hence Indian economy is also additionally getting influenced to large extent as most of the fruitful lands of the nation are being destroyed that forms the vital part of GDP.

So, through this framework we are presenting solution for this issue by introducing an automated and systematic farming strategies that enable farmers to cultivate in a productive way also with limited resources and greater yield which is assured and efficient.

1.5 OBJECTIVES

1. To update farmers with the new technology and to avoid manual labour.
2. To reduce wastage of water and enhance productivity of crops by providing them ideal condition.
3. To meet the difficulties such as severe weather conditions and advancing climate change, and environmental consequences resulting from intensive farming practices.
4. Design a model and connect it to the android app and cloud server.

CHAPTER 2

LITERATURE REVIEW

❒ 1. "**A Review on Smart Agriculture: Practices, Challenges, and Opportunities**"
❒ **Mohsen Amini Salehi, Adnan I. T. Al-Anbuky IEEE Access.**
2020

This paper presents a comprehensive literature review on smart agriculture systems focusing on IoT technologies. It covers various aspects such as sensor technologies, data analytics, communication protocols, and applications in agriculture. The methodology involves analyzing existing research articles, conference papers, and patents to provide insights into current practices, challenges, and opportunities in the field of smart agriculture using IoT

2. "Internet of Things (IoT) in Agriculture: Recent Advances and Future Challenges" Pradeep Kumar, Muhammad Bilal, Ibrar Yaqoob,Computers and Electronics in Agriculture.
2020.

This paper reviews recent advances and future challenges of IoT in agriculture, focusing on various applications such as precision agriculture, crop monitoring, and smart irrigation. It examines the integration of IoT with other technologies such as cloud computing and data analytics. The methodology involves analyzing recent research articles, conference papers, and industry reports to provide insights into the current state of IoT adoption in agriculture and highlight areas for further research and development.

3. "IoT in Agriculture: State-of-the-Art, Challenges, and Future Directions" Mohamed Elhoseny, Xianbin Wang, Aboul Ella Hassanien, IEEE Access
2017.

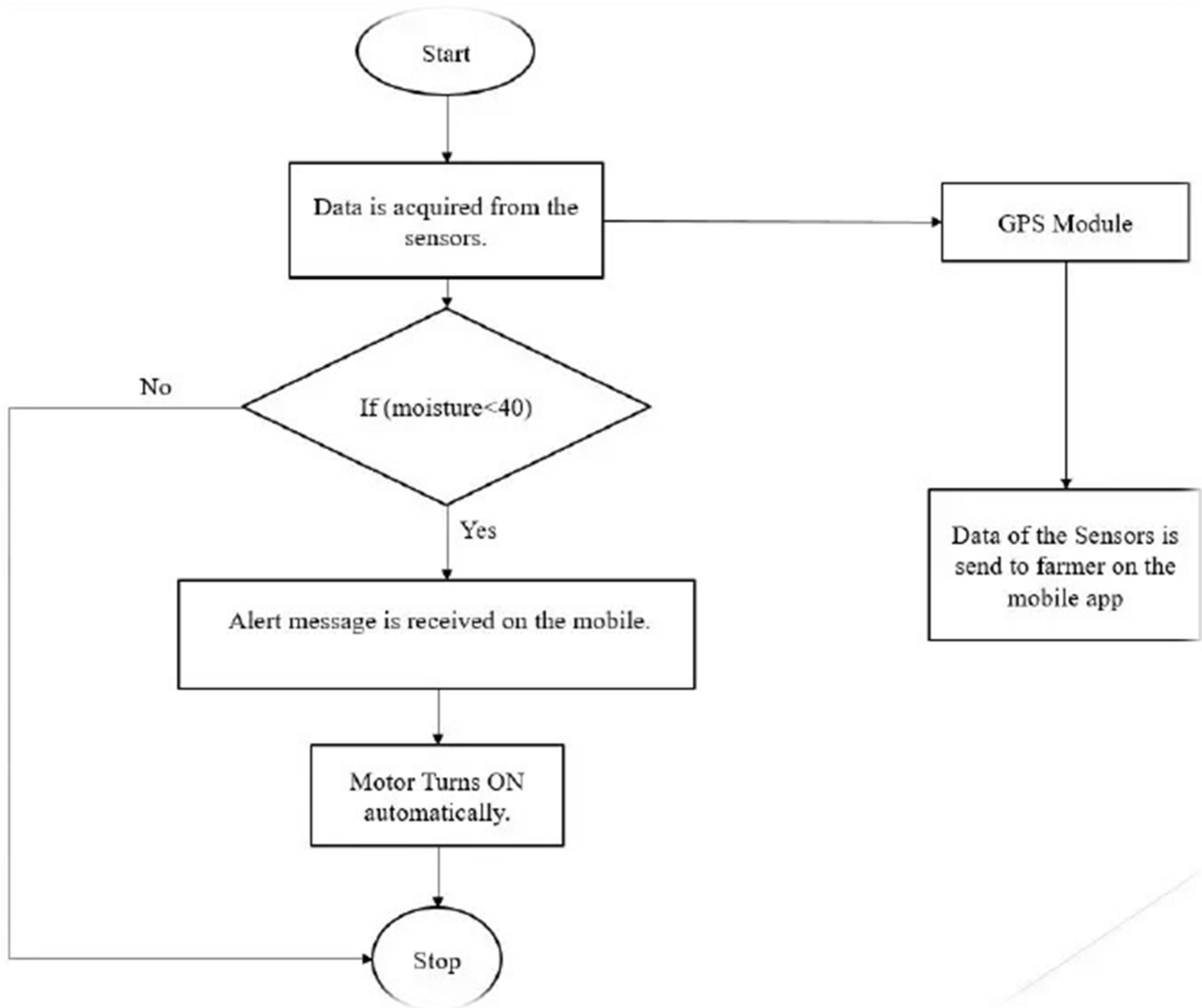
It provides a comprehensive overview of IoT technologies used in agriculture, including precision farming, smart irrigation, and livestock monitoring. The methodology involves analyzing existing literature, research articles, and industry reports to identify current trends, challenges, and opportunities in the field of IoT-based agriculture.

CHAPTER 3
SYSTEM DEVELOPMENT

3.1 Methodology

The basic building blocks of an IoT System are Sensors, Processors and applications. So ,the block diagram below is the proposed model of our project which shows the interconnection of these blocks. The sensors are interfaced with Microcontroller, data from the sensor is displayed on the mobile app of the user. Mobile app provides an access to the continuous data from sensors and accordingly helps farmer to take action to fulfil the requirements of the soil.

3.2 Flow Chart

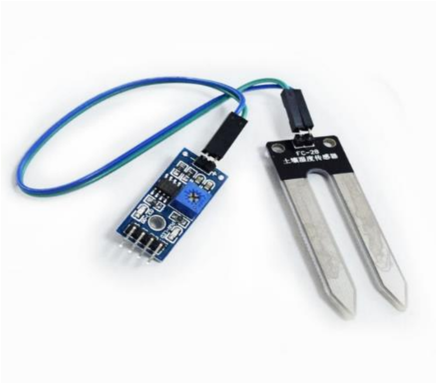


3.3 Hardware Tools

3.3.1 Level Sensor

The FC28 Level Sensor is a simple breakout for measuring the moisture in soil and similar materials. The water conductivity sensor is pretty straight forward to use. The two large exposed pads function as probes for the sensor, together acting as a variable resistor. The more water that is in the soil means the better the conductivity between the pads will be and will result in a lower resistance, and a higher SIG out.

Working Voltage	:	5V
Working Current	:	<20mA
Interface type	:	Analog/Digital
Working Temperature	:	10°C~30°C

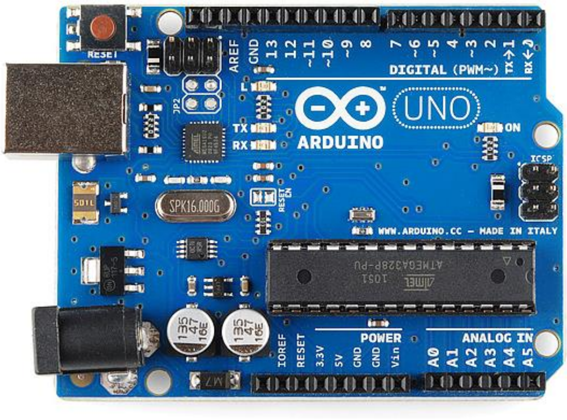


3.3.2 Pump Motor

It can take up to 120 litters per hour with very low current consumption of 220mA. Just connect tube pipe to the motor outlet, submerge it in water and power it. Make sure that the water level is always higher than the motor. Dry run may damage the motor due to heating and it will also produce noise.

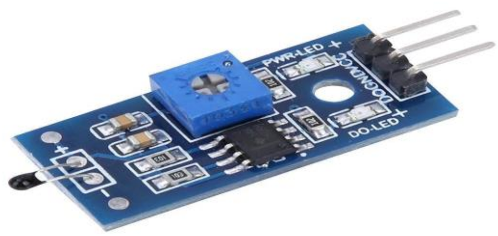
3.3.3Arduino

- Is an open source electronics platform based on easy-to- use hardware and software.
- Arduino uno is a Atme microcontroller board based on the ATMega328P (datasheet).
- It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 Mhz ceramic resonator (CSTCE16MOV53-R0), a USB connection, apower jack an ICSP header and a reset button.



3.3.4 Temperature Sensor

- Temperature Sensor (DHT-11) is used to monitor temperature and humidity of the atmosphere.
- The DHT-11 shown in Figure 3 is a basic ultra low cost digital temperature and humidity sensor.
- It uses a capacitive humidity sensor and a thermistor to measure the surrounding air and split out a digital signal on the data pin.

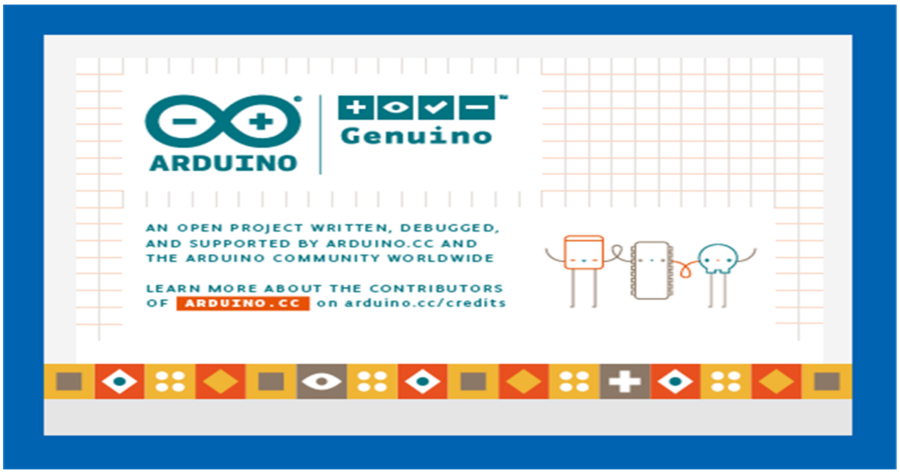


3.4 Software Tools

3.4.1 Arduino Ide (Integrated Development Environment)

Arduino IDE is an open source programming which is basically used to write & compile code using a module that is Arduino. This is an official programming software which makes compiling of code simple so a typical man can understand the learning procedure. This software is readily available for all operating systems like MAC, windows, Linux. Arduino Mega, Arduino Uno, Arduino Leonardo and more are range of Arduino modules that are available.

It basically has a text editor which is used for writing code, a text console, a message area, a toolbar with buttons for some of the common functions. Sketches are called as the programs that are written using this software. Coding on this software mostly uses functions of c/c++.

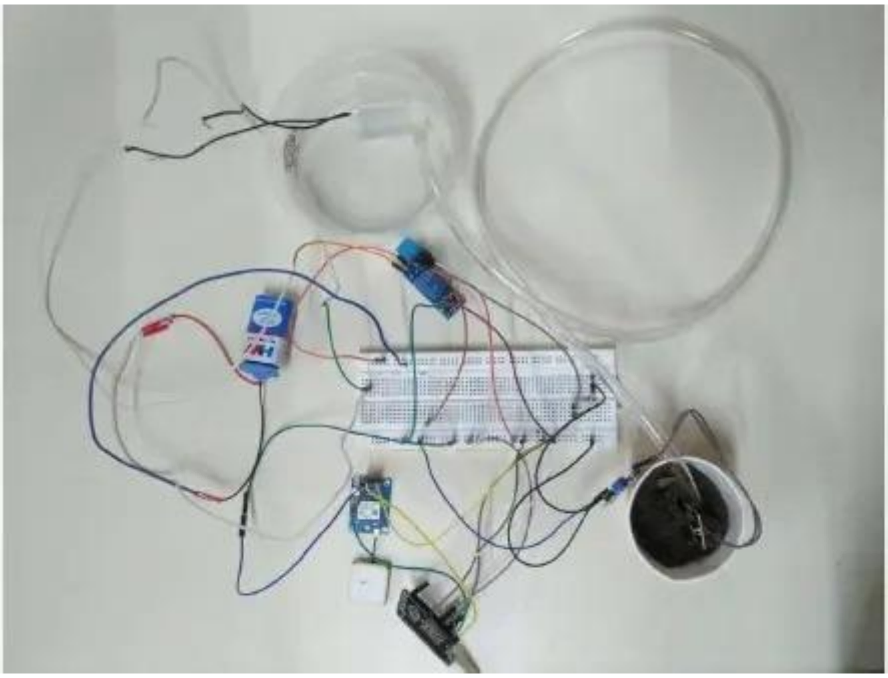


CHAPTER 4

RESULTS AND DISCUSSION

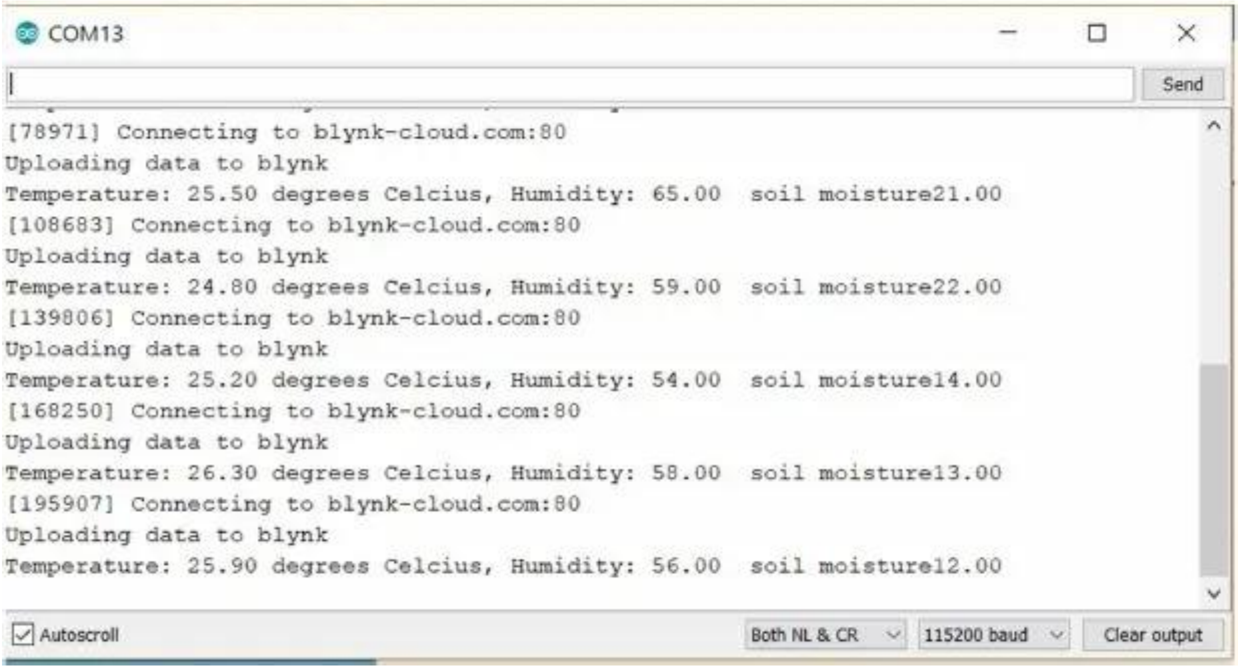
4.1 Circuit Description

The IoT-based smart agricultural system circuit integrates various sensors with a microcontroller to monitor and manage agricultural conditions. Soil moisture sensors, typically capacitive types, are connected with their VCC and GND pins to the power supply, and their analog output to an analog input pin on the microcontroller. Temperature and humidity are measured using DHT11 or DHT22 sensors, with their VCC and GND pins connected to the power supply and their data pin connected to a digital pin on the microcontroller, often with a pull-up resistor to ensure stable readings. Light intensity can be monitored using an LDR (Light Dependent Resistor), which is part of a voltage divider circuit, or a more precise sensor like the BH1750, with its VCC, GND, and data pins connected to appropriate power and input pins on microcontroller.



4.2 Results

The figures shown below depict the sensor readings of temperature, humidity and soil moisture, GPS location when the soil is DRY on serial monitor, mobile App and Cloud server.



CHAPTER 5

CONCLUSION AND FUTURE SCOPE

5.1 Conclusion

The proposed model explores the use of loT (Internet of things) in the agriculture sector. This model aims at increasing the crop yield by helping in predicting better crop sequence for a particular soil. Thing speak helps in real time sampling of the soil and hence the data acquired can be further used for analyzing the crop. We have also taken many readings of the soil moisture, temperature and humidity of the environment for various days at different times of the day. Data on the cloud also helps the agriculturists in improving the yield, evaluating the manures, illness in the fields. This system is cost effective and feasible. It also focuses on optimizing the use of water resources which combats issues like water scarcity and ensures sustainability. This model focuses on the utilization of loT in agriculture and the solutions proposed in this paper will improve farming methods, increase productivity and lead to effective use of limited resources.

5.2 Future Scope

The future scope of this project could be including variety of soil sensors like plI sensor, Rain sensor and then collecting and storing the data on cloud server. This would make the predicting and analysing processes more accurate. It also includes making different data mining algorithms suitable for data analysis in agriculture.

Ph sensor

Rain sensor

5.3 References

- Tope G., Patel A. 2014 . International Journal Of Current Engineering And Scientific Research (IJCESR). VOL.2.
- www.ijert.org/ smart – irrigation –system –using –wireless-sensor-network
- The ZigBee alliance website online available https://www.zigbee.org