UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF GREENHOUSE MONITORING SYSTEM USING IOT

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for Bachelor of Electronic Engineering Technology (Telecommunication) with Honours

By

MOHAMAD IZZAT BIN KAMAL IZANI

B071510111

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.....
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Alamat Tetap:
PT 1255 TAMAN SERI SETIA,
JALAN PADANG TEMBAK,
PENGKALA CHEPA ,
16100 KOTA BHARU,
KELANTAN

Tarikh:3/12/2008

Disahkan oleh penyelia:

.....
NURLIYANA BINTI ABD MUTALIB

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I hereby, declared this report entitled “Development of greenhouse monitoring system using IoT” is the results of my own research except as cited in references.

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APPROVAL

This report is submitted to the Faculty of Electrical & electronic Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Telecommunication) with Honors. The member of the supervisory is as follow:

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ABSTRAK

Rumah hijau memainkan peranan penting dalam sektor pertanian di negara kita, kerana ia boleh digunakan untuk menanam tumbuh-tumbuhan di bawah keadaan cuaca yang terkawal untuk mana-mana tahun untuk mendapatkan lebih banyak hasil. Walaupun penanaman tradisi tumbuhan memerlukan banyak kerja keras dan perhatian untuk memantau dan terdapat beberapa kelemahan dalam melaksanakan teknik penanaman tradisional. Sistem pemantauan rumah hijau menggunakan IoT sangat efektif untuk petani dan sistem ini berguna bagi petani untuk menanam tanaman penting secara ekonomi. Kebanyakan tumbuhan hanya boleh ditanam di beberapa iklim pada waktu tertentu tahun ini, tetapi perlu memantau untuk menjaga tumbuhan untuk mengetahui keadaannya. Tumpuan utama sistem ini berkaitan dengan pemantauan dan kawalan keadaan persekitaran seperti suhu, kelembapan relatif, sensor tanah dan menghantar maklumat ke halaman web dan kemudian plot grafik sebagai statistik. Kemudian sistem ini akan dikawal dengan menggunakan blynk untuk mengawal persekitaran di dalam rumah hijau. Terakhir sistem ini akan mengurangkan tenaga petani.

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ABSTRACT

Greenhouses play an important role in the agricultural sector in our country, as it can be used to grow plants under controlled weather conditions for any year to get more produce. Although the cultivation of plant tradition requires a great deal of hard work and attention to monitor and there are some weaknesses in implementing traditional planting techniques. Greenhouse monitoring system using IoT is very effective for farmers and this system will be useful for farmers to plant economically important crops. Most plants can only be planted in certain climates at certain times of the year, but need to monitor to take care of plants to know condition it. The main focus of this system deals with monitoring and controls the environmental conditions like temperature, relative humidity, soil sensors and sends the information to the web thingspeak and then plot the graph as statistics. Then this system will be control by using blynk to control the environment inside greenhouse. Last this system will be reducing the energy of a farmer.

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DEDICATION

To my beloved parents (Mrs Rosemawati Binti Haji Mat) and my family (Nurul Adlina Binti Kamal Izani, Nurul Fatin Binti Kamal izani, Nurul Anis binti kamal izani and Mohamad izzlin Bin Kamal izani)

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LIST OF ABBREVIATIONS

GSM	Global system of mobile communication
IoT	internet of Things
2G	second generation
USB	universal serial bus
PWM	pulse width modulation

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CHAPTER 1

INTRODUCTION

1.0 Introduction

The main aim greenhouse monitoring system to help the user to monitor and control the environment parameter. Based on this system it can be reduce the energy of human and assist to monitoring inside greenhouse. This system is the new technology for the monitoring system because this system used the latest technology Internet of Thing (IoT). This system enables the user to know the condition parameter greenhouse and find out the solution to solve the problem inside greenhouse

1.1Background

Based on (Rahman 2012) was study about agricultural in Malaysia. Malaysia obtained her independent 55 years ago and agriculture has contributed substantially to its gross domestic product. Currently about 11% of Malaysia‟s GDP is from agriculture. Agricultural research in Malaysia started in the early 1900‟s, when Dunlop Research Station was established in 1910. This was followed by the establishment of Chemara Research Station in 1920. All these were established by the British and research was focused mainly on rubber.

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1.2Problem Statement

In Malaysia there are many green houses built by the government, but farmers are unable to monitor the conditions greenhouse. Nowadays, various technologies have been used in industry sector. One project was be created to help the user to monitor the greenhouse. Based in this project it can be help the farmers to work under stress because they not need to go back and forth to water the plant and to ensure the condition of the plant and soil is good. And then this project can be reducing the time and energy to monitor the parameter greenhouse because this project can be control by mobile phone. At the same time it manually to monitor the greenhouse environment.

1.3 Objectives

Based on the problem statements discussed above, the objectives of this study are:

i. To investigate current monitoring system for greenhouse.

ii. To design an affordable monitoring greenhouse system using Internet of Things (IoT).

iii. To analyze the performance between change environmental and impacts to the plants with the proposed system.

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1.4 Scope

The scopes of this research work are established based on the objectives that mentioned. The greenhouse monitoring system is built to check the conditions and to control the parameter inside the greenhouse. Besides that Internet of Things (IoT) will be adopted as the communication devices with the users thus the greenhouse environment parameter can be update easily. Addition by using Internet of Things (IoT) the user can control the parameter of the greenhouse in long distance. Lastly, the nodeMCU microcontroller will set as the core controller for governing the input and output of this project.

1.5 Organization

This project focuses on development a system monitoring greenhouse. This report consists of five chapters. First, a short introduction to the problem, objective and scope are given in chapter one. Then, follow by chapter two literature reviews on existing methods adopted and various technologies that implemented in the previous project. In the mean times, the comparison regarding pros and cons will be discussed. Next, the components and method description that planned to use will be explained in chapter three. Furthermore, a brief of overview flow of the project may show here. In the chapter four, the results, including data tabulation and project analysis will be shown then discussed. Finally, conclusion and future recommendation will be emphasized in chapter five.

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CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter will review some journals from previous study that have been related to this topic. Development greenhouse monitoring system by using Internet of Things (IoT), is the final year project about to help farmer in the rural areas to be control and monitor of greenhouse.

2.1 Comparison Between Wi-Fi, Bluetooth And GSM

Bluetooth is a wireless technology used for short range data transmission from one device to another device which are both Bluetooth enabled. The transmission range is typically less than 10m and up to 100m besides for the latest model, the transmission range is from 40m up to 400m. Bluetooth works by sending and receiving radio waves in a band of different channel centred on 2.45GHz. Bluetooth devices can automatically detect and communicate with each other in a short distance.

Figure 2.1: Bluetooth module

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Wifi is a technology for wireless local area networking based on IEEE 802.11 standards. Nowadays, wifi is widely used all around the world since it can transmit data for a long distance with a high speed of data transfer rate. With wifi, users can communicate with each other from all over the world. However, users have to pay every month for the use of wifi or data hotspot.

Figure 2.2: Wifi module

GSM is a digital telephony system with 2G technology that is widely used in Europe and other parts of the world. GSM is a cellular network and it works by transferring data to the base station and base station controller will transfer it to the receiver through server.

Figure 2.3: SIM900 GSM

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