UNIVERSITI TEKNIKAL MALAYSIA MELAKA

AURDINO BASED AUTOMATIC PLANT WATERING SYSTEM WITH INTERNET OF THINGS

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

by

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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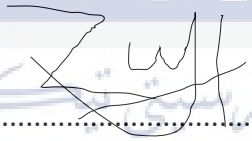

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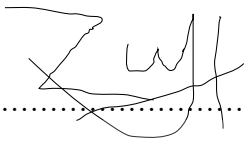
APPROVAL

This report is submitted to the Faculty of Electrical and Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Industrial Electronics) with Honours. The member of the supervisory is as follow:

Signature: 

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ABSTRAK

Pada zaman moden, disebabkan oleh peningkatan populasi, kekurangan makanan dan kekurangan air muncul. Oleh itu, kita harus memajukan bahagian pertanian untuk mengelakkan masalah ini. Tetapi di bahagian ini, pembaziran air sebagian besar berada dalam konteks pembalakan air, sementara pengairan menyiram kawasan pertanian. Di mana dan berapa banyak yang perlu disembur, mekanisme penyiraman manual memerlukan dua sudut pandang kritikal untuk dipertimbangkan. Kami juga mengembangkan mesin penyiram tanaman automatik untuk melengkapkan latihan manual dan memudahkan tugas tukang kebun. Selepas itu, sistem pengairan automatik untuk tanaman mesti dibina untuk bekalan air yang mencukupi di ladang. Makalah ini membincangkan alat pengairan tanaman automatik yang mengenal pasti kandungan kelembapan tanah secara automatik dan memilih sama ada pengairan diperlukan atau tidak dan berapa banyak air tanah yang diperlukan. NodeMcu esp8266 digunakan dalam sistem ini. Bahan kelembapan diprogramkan untuk dikesan dalam jangka masa yang panjang dalam hal tanah. Sekiranya bahan kelembapan lebih kecil daripada tahap yang telah ditentukan, ia akan terus membekalkan jumlah air yang sesuai sebelum melebihi had. Oleh itu, pam akan menyiram kawasan secara automatik ketika tanah kering, dan ketika tanah lembap, pam secara semula jadi akan mati dengan menghilangkan permintaan tenaga kerja dan menjimatkan masa. Strategi ini juga berguna untuk petani dan isi rumah. Sistem ini dikonfigurasi sedemikian rupa sehingga keadaannya sekarang dicatat dan pengguna diingatkan untuk menambahkan air ke tangki. Kedua-dua kemas kini ini dibuat melalui peranti telefon pintar. Kami yakin bahawa kita semua akan menikmati tanaman melalui model ini, tanpa perlu risau akan ketiadaan atau melupakan.

ABSTRACT

In the modern period, owing to the rise in population, food shortages and water shortages arise. So we have to advance the agriculture section to prevent this problem. But in this section, water wastage is mostly within the context of water logging, while irrigation is watering the agricultural areas. Where and how much to spray, the manual watering mechanism requires two critical points of view to be considered. We also developed an automated plant watering machine to supplement manual drills and make the gardener's task easier. Subsequently, an automated irrigation system for the plants must be built for the adequate supply of water within the fields. This paper deals with an automated plant irrigation device that identifies the soil moisture content automatically and selects whether or not irrigation is needed and how much soil water is required. NodeMcu esp8266 is employed in this system. The moisture substance is programmed to be detected over a span of time in the case of the soil. If the moisture substance is smaller than the predefined level, it will continue to supply the appropriate amount of water before it exceeds the limit. So the pump will automatically water the areas when the soil is dry, and when the soil is moist, the pump will naturally shut off by eradicating the labor demand and conserving the time. The strategy is also helpful for the farmer and the household. The system is configured in such a manner that its current condition is recorded and the user is reminded to add water to the tank. Both these updates are made by way of a smartphone device. We trust that we will all enjoy getting plants through this model, without being worried over absence or forgetfulness.

DEDICATION

I would like to dedicate to my supervisor, Mr Zulhairi bin Othman whom had guided me in complete this project. I would like also to thank my parents, friends and lecturer whom had helped and supported me. To my beloved parents and everyone, thank you.

ACKNOWLEDGEMENTS

Praise to God the most Gracious, the most Merciful. There is no power no strength save in God, the Highest, the Greatest.

First of all, I would like to take this opportunity to say thank you to my beloved project supervisor, Mr Zulhairi Bin Othman for his guidance, motivation, advice, and encouragement while conducting the whole project until successful.

A special thanks to my family, especially my beloved parents, who always gave me encouragement, support and strength throughout the project to move forward regardless of possibilities and obstacles. All the support and encouragement that physically and mentally give me a lot of happy.

Last but not least. I would also like to thank those who had helped me directly and indirectly.

Thank you.

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LIST OF ABBREVIATIONS

Mhz	Megahertz
MCU	Microcontroller
PIC	Programmable Integrate Circuit
IOT	Internet of Things

CHAPTER 1

INTRODUCTION

1.1 Overview

The full section will include a point-by-point outline of the details that has been retained. In addition, in expansion, the article supplied the client with some essential resources, such as project setting, challenge clarification, objectives, nature of function and possible goals of implementation.

1.2 Introduction

For households that wish to develop plants but don't have time to water them, an automated watering framework is important. This device would send the consumer programmed activity concurring to the response of the sensor. The device can sense the dampness of the soil in the event that it requires additional water by employing a soil moisture sensor. Following, within the water tank, the ultrasonic sensor will start to detect the water level. The most components of this extend are both sensors.

The system starts by detecting a sensor. Then, the information will be received by NodeMcu (reaction from the sensor). The NodeMcu will prepare the results, and the motor will run in the event that the result comes to a certain condition. By means of the drip pipe, the motor will pump the water. The sensor will start to sense soil moisture and the motor will stop infusing the water into the dribble pipe until the humidity comes to the ideal value.

The sensor will reveal the level of water within the tank for the ultrasonic sensor. In the event that the water level is too low, the water status or notification will be shown within the Blynk app. The state of the device will be transmitted to the user through Wi-Fi connect through

the utilize of IoT innovation. The points of interest is sent to a custom app that can be enacted on the Android phone. So, through their android phone, the user can get the notification or status of their plants.

1.3 Background

The study done on plant-watering frameworks will be talked about in this article. The reason of this investigate was to clarify certain viewpoints of the devices or instruments to be utilized in this extend. One of the points of this project is to make a system that's sufficient for the water system watering framework. The examination information found in this paper is obtained from two essential sources, a diary and a specialized report. The result should make a basic commitment to the agricultural sector. This request offers an energizing motivating force to progress our understanding of agricultural science. Individual interest is the principal reason for choosing this subject. Chapter two starts with the speculative calculations of the test and examines the related discoveries of others.

Some have already done automated watering framework examination. The soil moisture sensor has been widely utilized in this kind of project, based on past literature. The level of soil dampness can be recognized by the soil moisture sensor. To begin with, when utilizing climate figures, the automated watering framework. This machine uses a moisture sensor .The humidity sensor can distinguish the environment's humidity and decide the weather expectation value. The drip water system prepare is the watering framework utilized in this activity. A really effective approach for keeping up the utilize of water is the drip water system method. A show from previous writing shows that there's a water capacity tank. In this mission, ultrasonic sensors would be implemented to gather data on the amount of water within the tank.

Past writing has proven that knowing this venture is feasible. The bulk of studies use Altel as a NodeMcu .Much of the study is effective with the help of the soil moisture sensor, but there's not sufficient framework differences. The other tests utilize the humidity sensor for

weather determining. To form the device more usable, some of them attempt to connect them with IoT. The soil moisture sensor may be a great instrument to utilize in this project, based on my study, as the sensor can identify soil moisture. In any case, in our nation, Malaysia, the humidity sensor isn't suitable for weather-based utilize. Owing to the circle of the equator, our environment isn't predictable. The most excellent part of this project is to combine the device with the IoT. In arrange to ensure that the device works appropriately, this extend moreover includes another sensor to recognize the volume of water level within the tank.

1.4 Problem statement

This device would ensure that the plant is watered depending on its needs which the customer will be aware of the effects and status or informed of them.

We have so many failed plants within the neighborhood nowadays. On the off chance that we neglect this issue, it'll take a lot of time to replant the plant. The problem started when the households were involved with working and their lives. Each family has to have its claim edit and can plant everything they like in it, but they do not have time to water their plant.

The other thing is the utilize of water for effectiveness. For the most part, households utilize normal pipe water as it were to water their gardens. Any plants do not require as well much water at all. Another clarification is that they need to utilize as well much water to water their plant in one go since of their need of time, so they don't need to water their plant later on.

The another explanation for usually the plant's needs. Essentially, individuals do not know how humid their soil is. They might take a figure from their observation, but the exact meaning of the dryness or moistness of the soil can not be obtained. This conspire will allow the customer to induce the soil moisture value. The customer is additionally well taught around the moisture of the soil.

Automatic watering system would be built to solve this issue. Based on their require, the automated watering device would water the plant and the user is educated of the condition.

1.5 Objectives

After studying the above problem statement, the key objectives of the lead of PSM are:

i. The aims of this extension are to appear a watering device that can settle the situation of people. Moment, within the future, innovation will make human life more comfortable. Anything can be programmed with the use of a device. Within the future, besides, guarantee a more effective usage of water. It is possible to preserve a parcel of water by applying the drip water system handle. The household will save the water bill for their costs.

ii. Another, to create sure they receive satisfactory nutrients from the seeds. The watering plan is automated by applying the automatic watering framework, so the plant can start to gather the nutrients from the soil's moisture. The machine can at that point be improved with the trim for large-scale cultivating. A broader system may be made to assist agriculturists maximize their advantage by connecting to the framework.

iii. Hence, the aim of this extension is to arrange a basic, easy-to-implement NodeMcu based circuit to screen and record determinedly modified and controlled soil moistness and fertilizer level values in arrange to maximize them to realize the most strongly development and yield of plants. Finally, to challenge myself to construct a strategy on my own based on past literature review knowledge.

1.6 Scopes

The automatic scopes for the watering system are thin. This framework is suitable for home, office and small edit arrangement as it were. Only an Android mobile will interface to the device. The cloud server app (Blynk app) is used in this project to monitor the soil moisture, temperature, humidity and water level. The drip water system hose demonstrate will not be

more than 1 meter for this plant. Only one is the soil moisture sensor that will be utilized as the show is small. After that, the utilize of the water tank in this project was too small in measure. Based on my encounter, due to the constrained demonstrate, there's as it were one pump required in this project.

Based on the scale of the project, the scope may be modified. If the project is utilized by the agriculturist, all the limitations should be overlooked and the components must be included since the field is greater in scale. The targeted plant is pandan leaf, curry leaf, and rose plant.

1.7 Summary

This project focuses on Arduino Based Automatic Plant Watering System with Internet of Things and cloud server. Five chapters consists this article. At first, in chapter one, a brief presentation to the situation, point and scope is given. At that point, take two literature reviews of current approaches presented and various improvements that have been changed within the past wander after chapter two. The comparison will be talked about within the between times in terms of stars and cons. Following, in chapter three, the elements and handle representation simply select to utilize will be clarified. In reality, a description of the project's outline arrangement may show up here. In chapter four, the results of the comes about, including data organization and extend investigation, will then be tended to. At long last, in chapter five, the conclusion and conceivable recommendations will be lit up.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

From this article as this area contains papers on a comparable IOT think about based on a plant water system framework for programmed water system of plants. In arrange to total this article and subsequently the mission, the examination information is associated to a comparison with the client. A number of references as a direct to the effective completion of this chapter have been the involvement of the related investigate, such as posts, diaries and more particular awareness-raising thinks about that direct the client within the extend. For the post, references. In reality, all project-related fabric is included in this record. Both documentation will be utilized as a reference to this article's completion. Most of the reference information portrayed relates to a few of the key components of the links analyzed, since it would be supportive and valuable for both equipment and software components, relating to a number of of the basic components and ideas important to the subject.

2.2 Overview of Existing Project

2.2.1 Arduino based Automatic Plant Watering System with Internet of Things, March 2017

G. Nandha Kumar, G. Nishanth, E.S. Praveen Kumar and B. That's Archana. The said smart project uses a computer to irrigate plants that use iot technologies. The whole article would be a very main framework for exact real-time watering and good idea making for perfect real-time field measurements. But besides that, this article is the pattern to track the water source via an Android smartphone. The key role is the Arduino Node MCU microcontroller.