



**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

**ARDUINO BASED WEATHER REPORTING SYSTEM  
OVER IOT**

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

by  
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Sesi Pengajian: 2020

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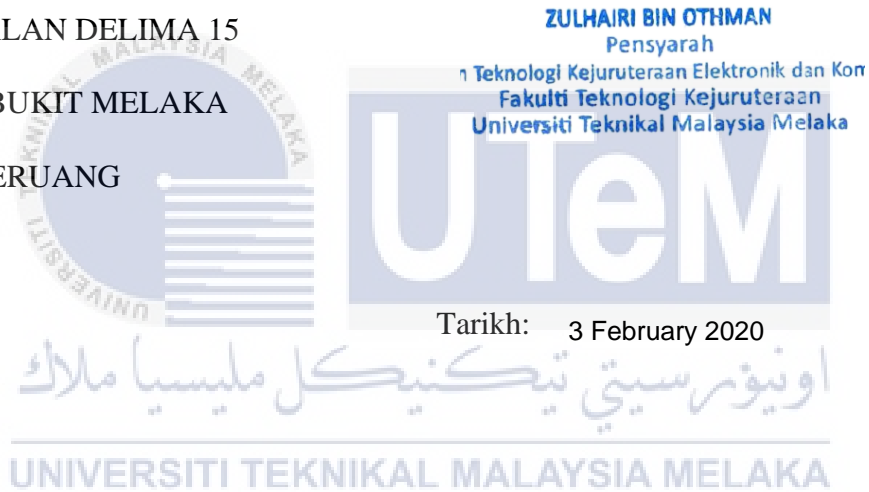
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I hereby, declared this report entitled ARDUINO BASED WEATHER REPORTING SYSTEM OVER IOT is the results of my own research except as cited in references.

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## APPROVAL

This report is submitted to the Faculty of Mechanical and Manufacturing 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:

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## ABSTRAK

*Projek ini membentangkan tentang pelaksanaan Sistem Pelaporan Cuaca dengan iot yang digunakan untuk pemantaun cuaca dengan bantuan sensor haba, kelembapan, dan hujan. Projek ini dikendalikan khas untuk para-para petani di Malaysia, manakala akan menjadi sebuah projek yang membantu semua pihak seperti , pembinaan , sukan , pengurusan acara serta rakyat biasa. Mengikut corak cuaca Malaysia yang berada di garisan khatuistiwa, cuaca yang tidak menentu dan maklumat tidak sampai pada waktunya. Sentiasa memberi impak negativ kepada semua rakyat terutamanya para petani, mengikut kajian pertanian di Malaysia merosot pada tahun 2019 dengan tahun 2014. Salah satu punca adalah cuaca di Malaysia yang tidak dapat ramalkan dengan strategik. Oleh itu projek mencadangan beberapa teknik antara nya mengembangkan pemantauan teknologi untuk membaca dan merekod parameter di zon pertanian, perindustrian dan pembinaan. Rangkaian Intenet akan manjadi sistem untuk memantau perubahan cuaca dan memberi mereka garis panduan masing-masing untuk merancang ladang mereka. Cuaca dipantau adalah suhu dan kelembapan. Sistem yang dikemukakan dalam makalah ini adalah penyelesaian yang maju untuk memantau keadaan cuaca di tempat tertentu dan menyediakan maklumat yang ada di mana sahaja untuk para petani. Dalam satu klik. Kami menggunakan teknologi yang disebut Internet of Things (iot) untuk menghubungkan peranti dan sensor yang terlibat menggunakan Internet. Dengan implimentaikan sistem dapat membantu pembangunan pertanian dan ekonomi dari pelbagai sektor.*

## ABSTRACT

A solution for the control of conditions at a given location and for the visibility of the information anywhere in the world is the framework proposed in this paper. Internet of Things (IoT), an innovative and effective solution to link the things with the network and the whole universe of things in a network, is the technology behind it. Electrical devices, sensors and electronic automotive equipment can be something here. At the same time, weather is the regular state of the environment, which is difficult to predict which affects mankind's activities and is extremely important in many different areas. But the new weather station is costly and voluminous on the market and creates discomfort. This project aims to design a weather station with real-time climate surveillance alerts, interfacing with it and analysing weather parameters on a cloud platform. In conjunction with the weather forecast approached with its monitoring system, these days it is unpredictable that due to the drastic climate change or the weather, monitoring is typically employed as a consequence of this weather reporting system in a control area such as homes, industry, agriculture and etc. Cayenne's Internet of Things (IoT) program can allow the weather conditions and information to be displayed anywhere in the world and display it on our Wi-Fi hotspot two-way communication. All the data collected is also saved in the Excel tool format of the Cayenne website to enable data analysis and maintained for up to 365 days. The device tracks the changes in the weather over the environment and provides users with the quickest way to access information from anywhere.

## DEDICATION

To my beloved father and mother





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## LIST OF ABBREVIATION

BDP -	Bachelor's Degree Project
IDE -	Integrated Development Environment
IOT -	Internet of Things
LED -	Liquid Crystal Display
UTeM -	University Teknikal Malaysia Melaka



# CHAPTER 1

## INTRODUCTION

### 1.1 Overview

The present sections will include an overview of the project. The relevant content such as project context, problem statement, objective, scope and the whole project plan was also highlighted.

### 1.2 Background

The importance of weather surveying is ordinarily extraordinary in various ways these days. Weather reports are vital for the conservation of great editing, for the safeguarding of the environmental stability of plants, farmers and related sectors. The quick method of control of natural parameters established by technology compared to its old system is uncomplicated. These sensors are electronic instruments commonly used to assess various typical physical and natural parameters. It allows quick responses and less vitality by using sensors in order to detect weather conditions. The latest frame illustrates how the weather observation station is monitored. It features remote technologies, furthermore, connected to Wi-Fi. The machine tracks and revises the weather conditions into the website. As weather conditions in a region, we can measure at any location, we are updating the purpose of the data collected on the website. A temperature sensor, a humidity sensor and a resistor are included in the frame. The meteorological parameters can be compared by all these sensors. The structure for farm usage is illustrated. Buildings and multinationals, but also temperature and humidity everywhere we need to know.

The computer was supplied with an Arduino for all sensor controls. In our context, we have selected the Wireless Protocol to evaluate application needs in order to continuously track and change the climate situation. There are several criteria for communication networks, but they are not only totally placed, anywhere informative communication processes. Other networking technology like IoT can communicate widely and allow the sharing of data. To link to a client server, the site is set up. The server must be connected to the client with an open IP address. All the sensor devices the customer requires to send data to the web server are part of the framework. In order to build a link between the Internet and the Arduino, we use a Wi-Fi module that serves as a different communication interface. The Wi-Fi module is a wireless network that works.

In order to distinguish weather data in wireless networks, weather sensors use an alarm system and an internal LCD display to alert users to these measured values. In an internal LCD panel, the IoT-website shows those values in the network-connected LCD and WIFI modem values. Where the customer can track without interacting with the company the actual weather situation.

This system basically informs the rain status of the downflowing board when raindrop falls on it. As the raindrop flows on this board at that point its short circuit current appreciation is sensed by the microcontroller by the raindrop sensor is basically the impressive sprinkling board. The values are displayed on an online webpage and LCD display at that time. This can be simple to work on an IoT based system for weather information.

### 1.3 Problem Statement

There are unique information centers and data transmitted to the gadgets in the general case of the weather stations. Most of the centers needed a high funding commitment to develop their claim information center in that region. In the conventional approach, the key problems were that gadgets are incredibly expensive and poorly accurate. If no gadget is identified for the present situation of the alerting device and the high-quality equipment is lagging.

The target of the project comes from the scenario experienced by agriculture in Malaysia. Several studies were carried out to determine the primary challenges faced by users during the project design. Analysis issues have been established. As we are seeing, the unpredictable climate change in Malaysia underlines the economic effects of the changes in weather reporting of agriculture in Malaysia, as it began in recent years, on the paddy market. Chamhuri et al. (2009) stated that the production of paddy could be influenced by changes in Weather Reporting as changes can lead to a water and other assets deficiency, which eventually would influence soil richness and lead to bug and disease flare-ups.

They conclude that this emergency weather report is very likely to enter Malaysia, especially Terengganu, Perlis, Kedah and Perak where the degree of depression is strong. Al-Amin et al. analyzed later. (2010) shows that the rice outputs at current CO<sub>2</sub> concentration points, which could decrease by 34.8 percent per hectare by 2060, are expected to drop from 4.6 percent to 6.1 percent due to an increase of 1.0°C. We show that the temperature increases above 26°C increases the breath of the plant and decreases the filling cycles. The times had to be shorter as the plant's growth rate rose, and the construction time dropped. According to the study, Malaysia will have a stressful drift at the end of PM's weather reporting situation. In each of the decades it is expected that the temperature will be expanding, while the precipitation in the other direction is expected. Some items regarding Southeast Asia have reported the adverse effects on rice production by adjusting the weather report. If the profound changes could not be carried about but worse by our current weather environment. Weather reporting stations that use various kinds of devices, such as thermometers, indicators, wind vanes, measuring stations, etc., typically use the existing weather structures.

Most of the disobedient ones use simple analog invention that is then registered and stored physically in a database. Here are some drawbacks of the current system.

- 1) Current weather monitoring systems, which are commonly used, consist of unconventional and heavy machinery that includes the amount, and must frequently track and adjust, of moving parts which require constant maintenance.
- 2) Installation and repair instruments used on a broad budget.
- 3) The device cannot provide quick emergency updates that might make matters worse and instant cloudy weather.
- 4) The key issue of the new power transmission system is high power consumption.

#### 1.4 Objective

- To overcome the current reporting system's problems with implementing temperature, rain and humidity sensor.
- To develop a wireless monitoring system with IoT which enable to analyze and keep data into cloud.
- To alert the users with advanced monitoring system alarm notification in real-time.

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## 1.5 Scope of work

This statement of the issue of the project focuses on Malaysia's agricultural sector problem. The definition of the smart method of weather reporting is demonstrated in this paper. For the Arduino we need a Wi-Fi module, which places important roles as a computer brain and the Arduino is used as a microcontroller. The optical sensor must also be programmed in the network, which can distinguish temperature and moisture differences at a given location.

The sensor tracks and transmits Arduino information on an ongoing basis. The Arduino transmits information to the cloud for its function and visualization. In order to gather cloud information's for investigation, we used IOT stages like Think Talk IoT. This can be employed in this method, if the temperature/humidity, other parameters and other parameters, to form major adjustments, including the notification of applications, text or telegraph or turning on a gadget.

In addition, sensing equipment for weather inspection in a farming area for large and minor shifts. Based on the parameters assessed on the basis of the farmers' conclusions it will yield legitimate reports. It will provide every information possible for farmers to choose paddy, farm mechanisms, etc. This will lead to reducing the effect on farmers of the weather risk.

## 1.6 Report structure

In order to allow clear information about this project, this research is already divided into 5 chapters, including a related introduction, literature review, methodology, results and recommendation. Furthermore, all three chapters display the logical move to understand the entire project. It is all about appreciation, other than that, and using the system design approach is evidence.

Chapter 1: This chapter will first present the short concept of the project and cover the summary of the whole project. This chapter also includes an overview of the project or its history, goals, project scope, the problem statement, and the outcome of the project.

Chapter 2: Second, how details on this project can be collected. All material on this project is divided into many papers, including newspaper, books, and related sources.

Chapter 3: Next, the entire approach used, and project execution will be discussed in this chapter to achieve the purpose of this project. In addition, in this chapter the technical programming code and hardware specifics were clarified.

Chapter 4: This chapter is subsequently very relevant for this project, as it covers the creation and execution of this project. Furthermore, this chapter also includes several analyzes of whether the targets for this project are accomplished. This chapter also addresses the outcomes of this project.

Chapter 5: Eventually, the whole substance of the thesis is addressed in this chapter. This is because it will also include the sources, discussion and all the connections to possible references and will include the most important feature.