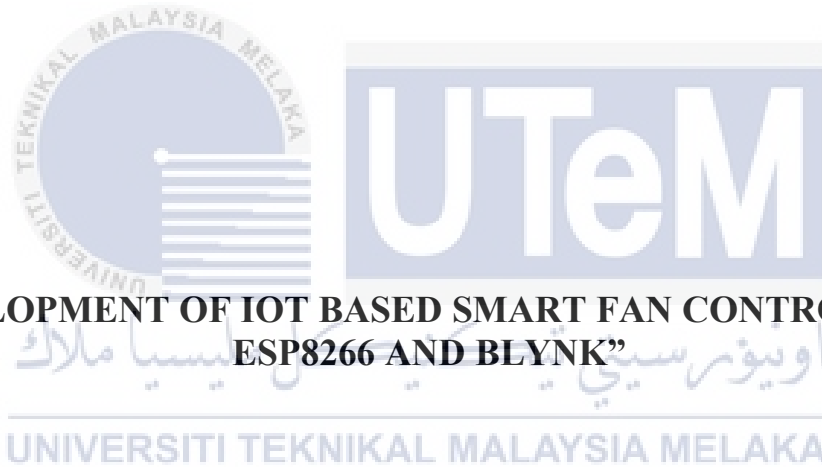




**Faculty of Electrical and Electronic Engineering Technology**



**“DEVELOPMENT OF IOT BASED SMART FAN CONTROL USING  
ESP8266 AND BLYNK”**

**MARDHIYAH BINTI ABD WAHAB**

**Bachelor of Electrical Engineering Technology with Honours**

**2023**

**“DEVELOPMENT OF IOT BASED SMART FAN CONTROL USING ESP8266  
AND BLYNK”**

**MARDHIYAH BINTI ABD WAHAB**

**A project report submitted  
in partial fulfillment of the requirements for the degree of  
Bachelor of Electrical Engineering Technology with Honours**



**Faculty of Electrical and Electronic Engineering Technology**

**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

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(MARDHIYAH BINTI ABD WAHAB)



(COP DAN TANDATANGAN PENYELIA)

Alamat Tetap:  
NO 42, JALAN 4,  
TAMAN SRI ANIKA,  
41100, KLANG,  
SELANGOR.

**Ahmad Zubir bin Jamil**  
Pensyarah Kanan  
Jabatan Teknologi Elektrik & Elektronik  
Fakulti Teknologi Kejuruteraan Elektrik &  
Elektrik  
Universiti Teknikal Malaysia Melaka

Tarikh: 13/1/2023

Tarikh: 25 January 2023

## DECLARATION

I declare that this project report entitled “DEVELOPMENT OF IOT BASED SMART FAN CONTROL USING ESP8266 AND BLYNK” is the result of my own research except as cited in the references. The project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature :

Student Name :

Date :

:

:

:

MARDHIYAH BINTI ABD WAHAB

13/1/2023



## APPROVAL

I hereby declare that I have checked this project report and in my opinion, this project report is adequate in terms of scope and quality for the award of the degree of Bachelor of Electrical Engineering Technology with Honours.

Signature : 

Supervisor Name : TS. DR. AHMAD ZUBIR BIN JAMIL

Date : 25 January 2023

Signature : 

Co-Supervisor : UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Name (if any)

Date : \_\_\_\_\_  
\_\_\_\_\_

## DEDICATION

This research entirely devoted to my loving parents, who have been a source of support during tough times when I thought of giving up. They constant provide for their children's the moral, psychological, physical, and economical requirements.

Thank you to my siblings, relatives, supervisors, coursemates and housemates who expressed their thoughts of advise and encouragement to complete this research.

Finally, I want to dedicated this project to the almighty ALLAH, and I appreciate ALLAH for the wisdom and for supplying me with strength, mental power, protection, and capacities, as well as a healthy existence.

اونيورسيتي تيكنيكل مليسيا ملاك

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## ABSTRACT

Traditional electric fan speed control systems only have three speed settings: low, medium, and high. Changing the fan's speed is a manual process that may be difficult for some users, such as senior citizens, disabled people, or anybody with mobility issues. The use of Internet of Things (IoT) technology overcomes this difficulty by allowing fan speed to be varied as a linearly rising speed function from extremely low to maximum speed. This article discusses how the Internet of Things works, as well as how to leverage IoT apps to automate fan speed adjustments, culminating in the Smart Fan. As a remote controller, a smart phone with a smartphone application is utilised. As a result, evaluations are performed to demonstrate the applicability of the Smart fan operated by Blynk necessary in the step-by-step process. First, a control term was invented to manage the smartphone-to-electric fan connection. For the remote control of electric fan speeds, this control method has shown to be a practical and easy solution. As a result, the goal of this project is to create a smart fan that is comfortable and affordable. This project is on a small budget by combining portions of the market that are already obtainable.

## ***ABSTRAK***

Sistem kawalan kelajuan sedia ada pada kipas elektrik hanya mempunyai fungsi butang dalam tiga mod: Rendah, Sederhana dan Tinggi. Menukar kelajuan kipas secara manual memberi masalah kepada kebanyakan pengguna, seperti pengguna warga emas atau kurang upaya atau pengguna-pengguna yang mempunyai masalah mobiliti. Menggunakan teknologi Internet of Things (IoT) mampu membantu menyelesaikan masalah mereka dengan membenarkan variasi dalam mengawal kelajuan kipas daripada sangat rendah sehingga maksimum. Kertas kerja ini menerangkan dengan jelas fungsi IOT, dan cara menggunakan aplikasi IoT untuk pelarasan kelajuan kipas automatik dengan cara ini, menghasilkan SmartFan. Telefon bimbit pintar dengan aplikasi mudah alih digunakan sebagai alat kawalan jauh. Oleh itu, analisis telah dilaksanakan dalam menunjukkan kebolehan kipas ini dikawal oleh Blynk. Pertama sekali, kawalan kipas ini dicipta untuk menguruskan sambungan kipas telefon pintar-ke-elektrik. Untuk kawalan jauh kelajuan kipas elektrik, kaedah kawalan ini telah terbukti sebagai penyelesaian yang praktikal dan mudah. Oleh itu, projek ini bertujuan untuk membangunkan kipas pintar alternatif yang ditangani dari perspektif keselesaan dan kos. Projek ini dilakukan menggunakan bajet minimum yang mungkin dengan menggunakan gabungan bahagian pasaran yang sedia ada



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## LIST OF SYMBOLS





## LIST OF ABBREVIATIONS

A - Ampere

MW – Mega Watt

V - Volt

PWM - Pulse Width Modulation

DC – Direct Current



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# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Nowadays, technology is an integral part of our daily life. The Smart Home Control System is an intelligent system that strives to automate the management of all electrical equipment technology. The demand for smart electric control systems in construction is rising where switches and the BLYNK provide control of appliances or electrical equipment app in mobile. Technology is progressing, and homes are becoming smarter. Modern homes are often transitioning from traditional switches to some form of IOT centralized control system. In this project, I will do the project about the Development of IOT Based Smart Fan Control Using Esp8266 and Blynk

#### The Internet of Things

The Internet of Things (IOT) concept proposes an internet will no longer be just a worldwide system for people to communicate with one another via computers, but it may also be a stage to electronic communication will be set up between devices and the universe around them.

Individuals that search the internet for items known as those webs surrounding object references to all the on the distant amongst objects, and those organizations will

generally build remote connections. It may also be set up by itself. These systems subsequently transmit data to another device on their own.

Fans are purposefully designed to maintain a comfortable room temperature. Using a fan has a number of benefits. People in Southeast Asia, for example, prefer to use fans rather than air conditioners since they are easy to install, low-maintenance, and the most appropriate equipment for controlling room temperature. In reality, the ceiling fan may be utilized to blow wind and dry garments.

The use of Internet of Things (IoT) technology overcomes this difficulty by allowing fan speed to be varied as a linearly rising speed function from extremely low to maximum speed. Internet of Things works, and we used IoT apps to make automated fan speed adjustments, in the Smart Fan. A smart phone running a mobile app controls the fan. As a consequence, tests are carried out to show that the Smart fan driven by Blynk can be used in the step-by-step operation.

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To begin, a control algorithm was developed to regulate the smartphone's interactive communications with the electric fan. This control approach has shown to be a convenient and simple method for remotely adjusting the speeds of electric fans. As a result, the goal of this project is to make a smart fan that is comfortable and affordable. This project will be done on the smallest possible budget by combining components of the market that are already accessible.

## 1.2 Problem Statement

1. The typical fan motor speed control systems are the speed of fan that can be altered in three modes which is low, medium, and high will change to 2 modes only. ON an OFF.
2. Any remote control requires periodic battery replacement, which adds to the annoyance and cost. When using the fan's manual speed control.
3. Setting the fan speed is a manual activity that can provide significant physical obstacles, especially for older persons, the disabled, and anybody with restricted mobility. Furthermore, the ability to handle equipment via a simple mobile app on a smart phone, would surely be beneficial.

## 1.3 Project Objective

In order to address the issues in the previous problem statement, this project has set the following objectives:

- a) This project changing the present speed control systems of the fan speed by altered it in two modes.
- b) This project help to cut the cost for remote control role that does not work and any remote control requires regular battery replacement by controlling using BLYNKs apps
- c) This project is for Human friendly by create an effective mechanism for controlling and can monitor fan using apps at mobile phone, BLYNK.

## 1.4 Scope of Project

To ensure the success of this project, we have determined its scope to be limited. By avoiding any potential problems, we have determined the boundaries of it specifically.

### Hardware

1. DC Fan
2. Microcontroller
  - ✓ ESP8266
  - ✓ Motor controller
3. Wires

### Software

1. Arduino IDE
2. Blynk

### Technique/application

An ESP8266 and a Motor Controller are used to control fan. The both components are connected together connected and will together help moving the fan. The ESP8266 NodeMCU are the major help by connected with Wi-Fi with hardware fan.

Blynk is a platform that lets you control your hardware projects easily on your gadget or smartphone. Once you have the Blynk app installed, you can create a project dashboard to organize your buttons, sliders, graphs, and other widgets.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

Literature review is a review of previous discussions, journals, and research papers on a certain topic of Development of IOT Based Smart Fan Control Using Esp8266 and Blynk. This chapter will be utilized in the future as a guide to aid with the experience of challenges to ensure the success of this project throughout the planning process.

Most companies, enterprises, schools, offices, and even homes now have at least one fan. For these people, it has now become a common device. The purpose of a fan is to manage the temperature, remove moisture, and remove smells from a room. A fan may swiftly cool down a place that has gotten excessively heated. When a place becomes excessively hot, people's bodies begin to exhibit symptoms such as muscular cramps and nausea. These are indicators of heatstroke or excessive heat that should be taken seriously. When a body's temperature rises beyond 40°C, it begins to shut down, causing harm to important organs such as the kidneys and brain.

The importance of good air quality cannot be overstated. Without proper ventilation, people can become seriously ill from the air toxins in their environment. The slow movement of the world towards automated systems has only made the problem more pressing, as modern exhaust fans are not as smart as they could be. There are also many concerns about how these fans are operated and how safe they are.

The actual reason for this difficulty is the user's inability to specify the best suitable ventilation and air quality inside a room. The user will have trouble sensing air temperature directly with their body. Furthermore, as a result of this issue, the user will forget to switch off the fan or will leave it on for an extended amount of time. This results in wasted power usage and poor functionality. The only way to solve this problem is to have a system or device that can automatically regulate and monitor

the fan. This project introduces an IoT-based smart exhaust fan that can adjust the fan based on the temperature and air quality in a place. This IoT-based smart fan is extremely beneficial if installed in factories, enterprises, offices, schools, and homes. As a result, the goal of this project is to develop and construct an IoT-based smart fan that can turn on and off based on temperature speed we desired by used Blynk Apps. The system can monitor and store data for temperature and air quality data collecting in an area, and lastly, an IoT system was developed in a prototype.

This project serves as the foundation for the IoT applications. An IoT device connects the entire IoT application to the physical environment. A temperature sensor and a motor controller are two instances of this interaction. The goal of this project is to supply fans that are categorized by the project in which they are applied, such as: (i) microprocessor, (ii) microcontroller, (iii) Connection Interphase, and (iv) internet of things.

## **2.2 MICROPROCESSOR CONTROL BASED**

### **2.2.1 PIC 16C622**

According to Mohammad Fotouhi, Ali Eydgahi, and Robert McCulley's paper Designing a Microprocessor Controlled Heater Fan for a Fireplace [1]. The main objective of this project was to have a PIC 16C622 microprocessor to control the speed of a fan ambient temperature directly beneath a fireplace mantel. The PIC 16C622 was chosen because of its ease of programming and compatibility with some other programme circuit. The student designed a complete circuit as well as software to manage the fan speed of a fireplace.

The goal for the project is to create a system that allows a smartphone application to operate a box fan through a microcontroller. Using a microprocessor offers programmability and precision control over the box fan's working range. This includes, but is not limited to, the use of a continuous speed curve rather than a collection of finite discrete speeds. The application would provide the user complete control over the fan's operation while also displaying information such as room temperature and operating times. The system