SMART PORTABLE WATER HEATER USING PELTIER

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BACHELOR OF ELECTRICAL ENGINEERING TECHNOLOGY

(Industrial Automation & Robotics) WITH HONOURS

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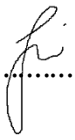

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ABSTRAK

Projek ini bertajuk Pemanas Air Pintar Mudah Alih Menggunakan Peltier. Projek ini adalah bertujuan untuk mereka bentuk dan membangunkan pemanas air pintar menggunakan peltier bagi mengurangkan kadar pembaziran makanan dan minuman di Malaysia yang semakin meningkat. Seperti yang diketahui, harga makanan dan minuman di Malaysia sama ada ianya belum dimasak atau yang sudah tersedia di kedai semakin hari semakin meningkat. Selain daripada itu, dengan adanya alat ini dapat membantu pengguna mengekalkan suhu minuman supaya dapat dihidang dengan dengan lebih sempurna tanpa menggunakan cara tradisional dimana cawan minuman ditutup diatas permukaannya dengan menggunakan penutup. Bagi menghasilkan projek ini, aplikasi Proteus akan digunakan bagi tujuan merekabentuk litar elektrik dan simulasi. Oleh hal yang demikian, projek ini dapat membantu pengguna untuk mengawal suhu hidangan dengan kadar yang telah ditetapkan sekitar 30℃ hingga 40°C, 41℃ hingga 51°C dan 52°C hingga 62°C. Akhir kata, sistem ini dijangkakan dapat mengawal suhu mengikut arahan daripada penguna supaya pembaziran minuman dapat dikurangkan.

ABSTRACT

This project is titled Smart Portable Water Heater Using Peltier. The project is aimed at designing and developing smart water heater using peltier to reduce the growing of waste foods and beverages in Malaysia. As we know, the price foods and beverages in Malaysia whether they are raw or available at stall are constantly increase. In addition, the presence of this system is to help the user to maintain the temperature of beverages so that it can be served more efficiently without using the traditional way such as covering up the surface of the cup by using plate. To develop this project, Proteus software will be used to generate electrical circuit and simulation. Moreover, this project will help the user to control the temperature of the beverages at a set of range around 30°C to 40°C, 41°C to 51°C and 52°C to 62°C. In a nut shell, the system is expected to control the temperature according to the user's order for the wasteful beverages to be minimized.

DEDICATION

To my lovely and beloved parent's, Mr Zulkifli Bin Ramli and Mrs. Nurul Ain Binti Zainuddin and my siblings for their guidance, supportive and pray. A full and higher appreciation to my supervisor, Muhammad Fareq Bin Ibrahim for the guidance and helping for completing this project.

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LIST OF SYMBOLS

mm	-	millimeter
V	-	Volts
A	-	Ampere
°C	-	Degree Celsius
°F	-	Degree Fahrenheit

LIST OF ABBREVIATIONS

UTeM	Universiti Teknikal Malaysia Melaka
BEEA	Bachelor Degree of Electrical Engineering
LCD	Liquid Crystal Display
PWM	Pulse Width Modulation
DC	Direct current

CHAPTER 1

INTRODUCTION

1.1 Introduction

The background project, objectives, problem statements and conclusion will be expound in general to brief an idea about the project in this chapter. Besides that, the structure on this project also had been described to give an early idea and understanding of the project. Other than that, this chapter will be explained generally background and view of the development project based on Industry Revolution 4.0 (IR 4.0).

1.2 Background

The revolution of Internet of Things (IoT) since 2011 until now, for Industry Revolution 4.0 (IR 4.0) have four major priorities in handling material process. There are the flexibility of movement, enabling in monitoring process, highly accurate and efficiency in wireless data communication. The movement of Industry Revolution 4.0 (IR 4.0) gives biggest impact towards the production qualities, reducing manufacturing cost, increase the operation speed and the most important is the safety of their production's frontliner that related to IoT based.

The industrial of beverages also are affected towards the movement of industry especially the production processes. The meaning of the production process is where the process of making up the drinks such as coffee from the traditional method towards the a utomation method. By referring to the Industry Revolution 4.0 (IR 4.0) timeline of coffee, at first, the

coffee was brewed by using a cup and a blotting coffee paper as stated in Figure 1.1. This traditional method takes a lot of time to brew just for a cup of coffee. As the slower the process of brewing a cup of coffee, someone in rushing cannot enjoy their drinks.

As the revolution of industry, there will always have a room for innovation and invention which is the earliest coffee maker was designed (Melitta Bentz, 1908). The impact of the coffee maker are to reduce the time consumption to brew a coffee and to reduce the wasteful of blotting paper. Even though the coffee maker catches a lot of eyes in the industry of beverages, it still shows the disadvantage of it which is it cannot maintain the temperature of the beverages. As example, when someone do something else while having a cup of coffee, the longer to coffee expose towards the atmosphere, the coffee will turn to cold. It will affect the taste of the coffee itself.

Figure 1.1: Brewing coffee with blotting paper

Figure 1.2: The earliest coffee maker machine

Nowadays, one of the modern technologies that used to brew a coffeeis by using a coffee maker. But coffee maker will not maintain the temperature as hot as it started to serve, it will turn warmer into cold for a long period. The portable water heater is designed to maintain the temperature the several range as request by the drinker. Certain range of temperature that will be set in this device is for low range is between 30°C to 40°C, medium range is between 41℃ to 51°C and high range is between 52°C to 62°C. This system will keep maintaining the temperature of the coffee as long as the coffee is still on top of the device. Therefore, this technology will provide low-cost, wireless in delivered performance with low power consumption.