SMART CASING

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I would like to dedicate this report to my family and my friends, whose has gave encouragement and support to me in completing this report.

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ABSTRACT

The aim of this project is to develop a system that can detect the temperature from the hardware system. This project is a standalone temperature and fan monitoring and control unit for the PC. Temperature controllers are needed in any situation requiring a given temperature kept stable. This project is suitable to be use for the system that operation for a long time. For example, like computer, motor or power supply . The main objective of this project is to overcome the problem that when the system is running for a long time, the temperature of the hardware is increase. For example the electronic components in power supply. The ability of this project is this project can control and maintain the value of temperature. This project will turn off the main power if the temperature is over heating. LM35S sensor are use to capture two different temperatures. This sensor can detect the temperature from 0 °C until 100 °C. Two temperature sensors will detect if there are any increases in the temperatures. The main control of this circuit is the PIC16f876A that have their program. This project use PIC16F876A to control DC fans and led when certain temperature was detected. The value of temperature always display on LCD screen. This program can be modified by user to activate the LEDs and fan according to their desired temperature.

ABSTRAK

Projek ini bertujuan merekabentuk suatu sistem yang boleh mengesan suhu semasa daripada komponen sistem. Projek ini sesuai digunakan untuk sistem yang beropersi untuk satu jangka masa yang lama. Sebagai contohnya seperti komputer, motor atau bekalan kuasa. Penghasilan projek ini disebabkan oleh masalah yang berlaku iaitu apabila suatu sistem beroperasi terlalu lama, ianya akan menyebabkan suhu komponen meningkat. Sebagai contohnya komponen elektronik dalam sesebuah bekalan kuasa. Antara kelebihan projek ini adalah ianya boleh mengawal dan menstabilkan suhu. Projek ini akan mematikan bekalan kuasa utama jika suhu semasa melebihi paras biasa. Sensor LM35S digunakan dalam projek ini untuk menentukan suhu semasa. Sensor ini boleh mengesan suhu dari 0 °C hingga 100 °C. Dua sensor suhu yang digunakan dalam projek ini adalah untuk mengesan sebarang perubahan suhu dan kipas akan beroperasi untuk menyejukkan komponen tersebut jika berlaku perubahan suhu. Projek ini mengunakan PIC16F876A untuk mengawal sensor dan kipas. Nilai semasa suhu akan dipaparkan pada panel paparan. Program pada PIC boleh diubah oleh pengguna untuk aktifkan led dan kipas mengikut kesesuian.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This project is to control and maintain the value of temperature. This "Smart Casing" project will shut down the main power if the temperature is over heating. This is the ability of this project that can protect our hardware from damage. Two temperature sensors will detect if there is any increment in the temperatures and the fan will turn on to cool down the temperature of the system. If the temperature is still increasing, the relay will cut off the main power. By using this project the user also can set their suitable value for their system at the program on the PIC.

1.2 Objective

The objectives of this project are:

a) To create a system that can stabilize the temperature.
b) To understand the programming that can check the different between two temperatures.
c) To design a casing with a good air flow.

1.3 Problem Statement

There are many method used for transportation in production and storage system in factory.

1.3.1 Inefficient air flow inside CPU

Due to heat raises and power supply, CPU, and Northbridge chipset produce so much heat (all centrally located by the rear exhaust fan), it is recommended that the exhaust fan be placed in the rear, below the power supply. This will improves computer airflow around these essential components (PSU, CPU, and Northbridge chipset). [3] The idea behind a rear exhaust case fan is the creation of a "wind tunnel" in the computer just over the CPU and Northbridge chipset. It is not only the absolute quietest case fan available at only 12 decibels, but it is also among the best in terms of airflow produced by a quiet case fan.

1.3.2 Fast temperature increment of hardware component

Computer cooling is the process of removing the heat from computer components. Because a computer system's components produce large amounts of heat during operation, this heat must be dissipated in order to keep these components within their safe operating temperatures. In addition to maintaining normative function, varied cooling methods are used to either achieve greater processor performance (over clocking), or else to reduce the noise pollution caused by typical (i.e. cooling fans).

Components which produce heat and are susceptible to perform loss and damage include integrated circuits such as CPUs, chipset and graphics cards along with hard drives (though excessive cooling of hard drives has been found to have negative effects). Overheated parts generally exhibit a shorter maximum life-span and may give sporadic problems resulting in system freezes or crashes.

1.3.3 Casing Material

In this project there are two materials that will be used to build this casing. Firstly, Alloy is good material to build the base for the hardware like CPU, hard disk, graphic cad and sound cad. This is good materials that can absorb heat temperature from the hardware. Second is transparent plastic. This material looks more stylish. The transparent casing also can protect our hardware from current leaking.

1.4 Scope of Project

This project will use PIC16F876A to control NPN power transistor further drive DC brushless fans and relay when certain temperature was detected. The value of temperature always display on LCD screen. In this project, two LM35 are used to capture two different temperatures. The main control of this circuit is the PIC16f876A that have their program. This program can be modified by user to activate the LEDs and fan according to their desired temperature.

This system will use two LM35s sensor to detect the temperature that connected with the main circuit controller. This sensor function is to compare the value of the temperature. For example the first programming, temperature is set at 50 °C and 80 °C. It means when the temperature is 50 °C, the fan will switch on and switch off again when the temperature is below 50 °C. When the temperature increase to 80 °C, the main power will be automatically switched off.

Software was written for one unit. By using Protius software, the data is keyed in so that no device will be used to feed the data to the program. This project has In Circuit Serial Programming (ICSP) that is used for loading program. ICSP gives the user a convenience way to load program into PIC microcontroller without removing the PIC from the circuit board. The program can be modified for the desired temperatures to activate the LEDs, fans and buzzer.

1.5 Overview of Project Methodology

Firstly, this project starts by searching for literature reviews from books and journals as a readability sources. Then the suitable circuits were identified. Secondly, the next activities are circuit design and programming. Circuit will be design by using PROTEL, PROTEUS and MULTISIM software. Beside this, frame work for programming need to draw to help the programmer clearly to start their work.

The next stage would be simulation for the circuit. The labs experiments are the way to verify the overall designed are operation. Beside that, Mp lab software will be used as compiler in programming. All the coding must be checked before using the coding. It can checked before by using the compiler software. Next, all components will be ordered refer to all these circuit in this project. After that all the hardware will be constructed. Then hardware circuit will be transferred to PCB board and the etching process will be done.

In the end, a model will be build to place the project and all the devices should be connected to each other to ensure the whole section is ready to control device.

1.6 Report Structure

This thesis consists of five chapters. Chapter I will describe about the brief overview and the definition about the project such as introduction, objectives, problem statement and scope of the project.

Chapter II will discuss about research and information which are related to this project. Every fact and information is gained from different references and discussion so that the best technique and method can be implemented on this project. This will be based on the literature review and information about the project. Every facts and information which found through journals or other references will be

compared and the better methods have been chosen for the project. The software development that are using is PROTIUSS, PIC COMPILER and PROTEL.

Chapter III will discuss about the project methodology used in this project such as data acquisition module, a pre-processing module, normalization and re-sampling module, a feature extraction module, a classifier module and a decision module. All these methodology should be followed for a better performance.

Chapter IV will describe about the project finding such as progress result and analysis of the voice recognition. The result is presented by using tables, graph and figures.

The final chapter, Chapter V will give the conclusion of the whole project which includes project finding, achievement analysis and conclusion about the research implementation which have been used. The project suggestion for enhancement also will be discussed.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

Basically this chapter will reveal the knowledge pertaining this field of project in which is gained through a lot of resources such as reference book, papers, journal, articles, conferences articles and documentations regarding applications and research work.

This shows how the theory and the concept have been implemented in order to solve project problem. The theory understanding is crucial as guidance to start any project. The result of the project cannot be assessed if it is not compared to the theory.

2.2 *"Low cost cooling home sistem"* by **Muhamad Fauzi B Yahya**

2.2.1 Overview how do Temperature Controllers work

To accurately control process temperature without extensive operator involvement, a temperature control system relies upon a controller, which accepts a temperature sensor such as a thermocouple or RTD as input. It compares the actual

temperature to the desired control temperature, or set point, and provides an output to a control element [1]. The controller is one part of the entire control system, and the whole system should be analyzed in selecting the proper controller. The following items should be considered when selecting a controller.

i. Type of input sensor (thermocouple, RTD) and temperature range
ii. Type of output required (electromechanical relay, SSR, analog output)
iii. Control algorithm needed (on/off, proportional, PID)
iv. Number and type of outputs (heat, cool, alarm, limit)

2.2.2 Parts of a Temperature Controller

All controllers have several common parts. For starters, controllers have several inputs. The inputs are used to measure a variable in the process being controlled. In the case of a temperature controller, the measured variable is temperature.

2.2.3 Inputs

Temperature controllers can have several types of inputs. The type of input sensor and signal needed may vary depending on the type of controlled process. Typical input sensors include thermocouples and resistive thermal devices (RTD's), and linear inputs such as mV and mA [4]. Typical standardized thermocouple types include J, K, T, R, S, B and L types among others. Controllers can also be set to accept RTD as a temperature sensing input. A typical RTD would be a 100 ohm, platinum sensor [4].

Alternatively, controllers can be set to accept voltage or current signals in the mV, volt, or milliamp range from other types of sensors such as pressure, level, or flow sensors. Typical input voltage signals include 0 to 5VDC, 1 to 5VDC, 0 to 10VDC and 2 to 10VDC. Controllers may also be set up to accept mV signals from sensors that include 0 to 50mVDC and 10 to 50mVDC [1]. Controllers can also accept milliamp signals such as 0 to 20mA or 4 to 20mA [8].