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THE DEVELOPMENT OF PROTOTYPE FOR AN AUTOMATED SYSTEM INTELLIGENT FAN (STAND AND CEILING) WITH SENSOR TECHNOLOGY FOR HOUSE APPLIANCES.

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ABSTRACT

(Keywords: ceiling fan, microcontroller, surrounding temperature, temperature sensor)

This project focuses more toward conservation of energy where improvement is made to an ordinary AC ceiling fan by integrating a microcontroller as the main system. The fan will intelligently interact with the surrounding temperature change (read by temperature sensor) to control the speed of the fan. With universal Smart Fan Controller AC fan concept, power can be reduced a lot since the temperature at night is gradually decreasing where the speed of fan spins to maintain the comfortable temperature in the room area. During cold condition, the fan spins slowly but still capable to cooling the room area. If temperature increases the fan automatically changes its spin to the most suitable speed to maintain the room temperature area to make the user always feel comfortable.

In this project the saving energy aspect focuses at night where the temperature is gradually decreasing from 12.00 pm until 7.00 am. Due to the intelligent aspect of this system the energy consumption could be reduce from the usual type of ceiling fan. From the results of the project it is proven that the hardware can reduce the power consumption up to 27%. Beside the energy reduce it's improve the quality of sleep at night since the device control the speed of the fan and user will get the most suitable ambient temperature at night during sleep according to the temperature read by the temperature sensor.

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AC	- Alternating current
DC	- Direct current
LED	- Light Emitting Diode
RTD	- Resistance Temperature Detector
PCD	- Printed Circuit Board

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CHAPTER 1

INTRODUCTION

1.1 Problem statement

Nowadays there are many issues faced by Malaysian. First is tariff electricity is increased currently, it"s burden the low income family in their everyday life. So this will affect their quality of life and their quality of work, thus indirectly will slow down the country"s development.

Facts that we cannot escape is energy wasted a lot during sleep time at night by using ceiling fan. It is because the temperature at night until morning is decreasing; at the beginning before sleep, user will use the highest speed of the fan to cool down the room temperature. Normally user will forget and will not wake up while sleeping to decrease the fan"s speed although the ambient temperature is at low speed. As speed of the motor rotating constant at high speed it will consume more power, thus create more power waste.

Indirectly power waste also create environment defect and create green house effect. The power production in Malaysia still using charcoal, more undesired gasses will be released during the production thus contaminate the air. It will affect the people health and create more diseases.

Fan controlling method today still use manual operation. User has to change the speed manually. So it will give problem for disable people and kids. Usually the ceiling fan regulator is placed at the middle of the wall so it is hard for those do not have enough tall to reach the regulator.

1.2 Project objective

The objectives of this project are:-

1. To develop a universal controller for conventional for AC ceiling fan capable of controlling the speed automatically based on the ambient temperature.
2. To analyze the energy consumption by using the standard AC ceiling fan and smart sensor plan.

1.3 Project scope

1. Develop a microcontroller based system that control ceiling fan using temperature sensor.
2. Analysis and experiment will be conducted in laboratory. The result will be compared to the initial power usage of the AC ceiling fan.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Recently on July 15 2011 we have been announced about the increase in the power tariff in Sabah and Labuan to go up by 15% [1]. These phenomena will affect our people daily activities. They are trying to use as less as possible energy to keep the daily works run as usual and will note waste their money. In our country we can see our people still lack awareness about energy saving.

Today, our country is going forward in creating green technology. In Malacca as example, the state already starts the step in going to greener environment. Solar technology is widely use and the government has invested a lot to get the objective of green state achievable. By year 2020 we can imagine how less energy wasted if we implement such technology.

Energy saving sometimes called efficiency energy use is using the same level of performance, comfort, and convenience. For example, an energy efficient compact fluorescent light bulb (CFL) uses 85% less energy than conventional incandescent bulb to produce the same amount of light. Thus much more energy efficient or energy saving and will use less power electricity. In general, efficient energy use is achieved by using more efficient technologies or process rather than changing human behavior [2].

The global warming also arouse the awareness of public in energy saving. Therefore new energy saving technologies is appearing and developing rapidly, at the same time energy regeneration or alternative technology is developing in large scale [3].

Basically energy problem can be classified into the following three solutions in general: energy saving, energy searching and energy recycles. Energy saving is an important item among the concept of environmental protection, economy and improved science and technology [3].

At the industry level, since our country is developing country many mega industries company have been based here by foreign company. There is lots of energy wasted that happen and trapped in our environment which lead to unhealthy life for our people. Carbon dioxide largely released to the atmosphere without control. For long term that can leads to

undesired phenomena to happen such acid rain, flood, landslide and others. Many devices invented to reduce all the waste in energy such power factor and inverter technology.

At the domestic level energy wasting also largely occurs everywhere. Energy is wasted although nowadays many technologies invented to reduce the power usage at home, especially home appliances. Energy efficient home is a home that uses less energy and is more comfortable and healthier than before. With today"s technologies and professional services, just about every home"s energy use can be improved in affordable way [2]. Many home appliances has been improved such voltage step-down ballast, voltage controller and others.

Table 2.1: Energy consumption by building type in Malaysia 2005(%) [4]

	Residential	Hotels	Shopping Complexes	Offices
Lighting	25.3	18.0	51.9	42.5
Air Conditioning	8.3	38.5	44.9	51.8
Total	33.6	56.5	96.8	94.3

The breakdown of energy used for lighting and air conditioning is shown in the table 2.1. More than half of the total energy used in commercial buildings is for lighting and air conditioning [12]. From the table we can say that residential usage contributes a quite high number in energy consumption in our country. So education and training should emphasized on effective public awareness on energy issue such energy saving and the use of renewable energy.

This chapter will discuss about the article that may related to the project. It is consisting of the products that are developing by institution before this project and some of them have been invented and available in the market. There are various ways to reduce power consumption at home from the usual method to the high technology method.