



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Development of Smart Care Application System for Pet by Using Microcontroller

This report submitted in accordance with requirement of the Universiti Teknikal
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Technology (Telecommunication) (Hons.)

By

AHLAM AFIQAH BINTI ZAKARIA

B 071310443

911215-08-5812

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Signature :
Author`s Name : Ahlam Afiqah Binti Zakaria
Date : 3 June 2016

APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Telecommunications) (Hons.). The member of the supervisory as follow:

.....

(Project Supervisor)

Ahmad Fauzan Bin Kadmin

ABSTRACT

This project is to build controlling system for cage. The purpose of this project is to create and develop a system that controlling fan, Liquid Crystal Display (LCD), Bluetooth and also to display temperature/humidity sensor. Smart Care Application System for Pet is a control system which able to dry a pet fur after takes a bath. In this project microcontroller ATmega328 is used as a main component to control whole system and the Integrated Development Environment (IDE) software was used for write program. Microcontroller will interface with the components like temperature/humidity sensor and Bluetooth. Sensors are used to receive and send the signals to the ATmega328 to control this system. Massachusetts Institute of Technology Application Invertors 2 (MIT AI2) software was used. Besides that, to develop a circuit, the Fritzing software was used on this project. In order to realize this project, extensive background studies have been done on temperature/humidity sensors, microcontroller ATmega328, and MIT AI2and Fritzing software. The basic and important methodologies that have been used in this project are literature review, system development, field testing and build up software. This project can be implemented at home and veterinary.

ABSTRAK

Projek ini dibina untuk mengawal sistem kawalan sangkar. Tujuan projek ini adalah untuk mewujudkan dan membangunkan sistem yang mengawal kipas, Liquid Crystal Display (LCD), Bluetooth dan memaparkan suhu/kelembapan sensor. Sistem pembangunan penjagaan pintar untuk haiwanialah sistem kawalan yang dapat mengeringkan bulu haiwan peliharaan selepas mandi. Dalam projek ini mikropengawal ATmega328 digunakan sebagai komponen utama untuk mengawal keseluruhan sistem dan perisian Persekitaran Pembangunan Bersepadu (IDE) telah digunakan untuk program tulis. Mikropengawal akan berinteraksi dengan setiap komponen seperti suhu sensor / kelembapan dan Bluetooth. Sensor digunakan untuk menerima dan menghantar isyarat kepada ATmega328 untuk kawalan sistem ini. Massachusetts Institute of Technology perisian Aplikasi Invertor 2 (MIT AI2) telah digunakan dan berfungsi sebagai suis hidup / mati dan memaparkan keluaran. Selain itu, untuk membangunkan litar perisian Fritzing digunakan dalam projek ini. Bagi merealisasikan projek ini, kajian latar belakang yang luas telah dilakukan pada suhu / sensor kelembapan, ATmega328 mikropengawal, dan MIT AI2 dan perisian Fritzing. Metodologi asas dan penting yang telah digunakan dalam projek ini adalah kajian literatur, pembangunan sistem, ujian lapangan dan membina perisian. Projek ini boleh dilaksanakan di rumah dan veterinar.

DEDICATION

Alhamdulillah, praise to the Almighty Allah S.W.T

This thesis is dedicated to:

My Parents,

(Mr Zakaria Bin Md Syarif and Mrs Halimah Binti Tamin)

My beloved family,

(Hailzamdand Bin Zakaria, Hazliziana Binti zakaria, Haliza Binti zakaria, Atikah Imar Binti Zakaria, Muhammad Taufiq Bin Zakaria, Khairunnisa Binti Zakaria, Muhammad Taqiuddin Bin Zakaria and Syazwani Binti Zakaria).

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And all my friends

Thanks for their encouragement and support

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Alhamdulillah, thank you Allah because of His blessing, I finally complete and finish my final year project successfully.

During the process to complete my project objective, I do a lot of research either by using internet, reading past year thesis, reference books and journal. With the guidance and support from peoples around me, I finally complete the project due to the time given. Here, I want to give credit to those who helped me to achieve what I had achieved in my final year project.

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LIST OF SYMBOLS AND ABBREVIATIONS

LCD	=	Liquid Crystal Display
MIT	=	Massachusetts Institute of Technology
OS	=	Operation System
IDE	=	Integrated Development Environment
IJESC	=	International Journal of Engineering science Computing,
MIT AI2	=	Massachusetts Institute of Technology Application Inventor 2
FYP	=	Final Year Project
DC	=	Direct Current
BLE	=	Bluetooth Low Energy
IEEE	=	Institute of Electrical and Electronics Engineers
Max.	=	Maximum
GHz	=	Gigahertz
MHz	=	Megahertz
I/O	=	Input / Output
mA	=	Mill ampere
USB	=	Universal Serial Bus
V	=	Voltage
IOT	=	Internet of Things
PC	=	Personal Computer
INT	=	integers

CHAPTER 1

INTRODUCTION

This chapter covers the introduction of the project, background study, the problem statement, and the project objective, the scope of work, the project significance and the summary of this project.

1.1 Background

Development of smart care application system for pet is a smart care application system for a health multifunction cage product for pet. This product introduces a versatile cage. Not only that, but this products make it easy for user to dry fur and reduce time. The main function of smart care application system for pet is to dry fur animals after take a bath.

In smart care application system for pet, microcontroller Arduino UNO ATmega328 was used to control the system. Microcontroller is a controller that widely used in controlling process. Microcontroller used to control the devices by receiving the input signals, processing the input signals and sending the output signals. Dc fan system, Liquid Crystal Display (LCD) and temperature/humidity sensor are controlled by microcontroller Arduino UNO board in smart care application system for pet.

This project also uses Bluetooth system for data transmission system to a smart phone. Besides that, Massachusetts Institute of Technology (MIT) application inventor also used to design application for Android Operating System (OS). This product can be used at home or at the veterinary.

1.2 Problem Statement

The problem statement of this project is manual pet drying method using hot air dryer takes a lot of time to complete. Hot blow dryer process traumatized pet psychology. Current hot blow dryer might burn the fur. No temperature /humidity display in this system during drying process. The main reason to make smart care application, because users recently bathed cat without drying and it will impact healthy to the pet. From research by user, if using a manual dryer, it will take time to dry the fur.

1.3 Objective

There are few purposes need to be achieve from the completion of this project. The main purpose of this project is:

- I. To develop smart care application for pet.
- II. To analyses the performance of temperature/humidity and dry time.

1.4 Scope

Smart care application system for pet is a new product that introduces the smart cage multifunction. In Figure 1.1 show that the project diagram Smart Care Application System for Pet and Figure 1.2 show Smart Care Application system for pet project flow (connection/Diagram of System).

First of all this project we were used microcontroller system because Microcontroller system is a single chip computer that can be used in control application. This microcontroller was function as a device that can controller the equipment. Then, we were design the fan control circuit of smart care application for pet by using Arduino sketch. This circuit will show how the fan functioning. Other than that, we also used DHT11 to design the temperature/humidity circuit. Second, we were using Arduino integrated development environment (IDE) compiler as an application to make a program. In this section, we will create a system program that shows how the fan and temperature functions. Besides that, we also program how much time it takes to dry the fur of pet and by using our smart phone android application we will displays the value of temperature/humidity of animals fur after drying in mobile phone.

Third, by using Bluetooth device we make a connection from cage to the phone. This Bluetooth function as a connection for phone to transmit and receive the data. The data that has been program will transfer to the cage by using Bluetooth.

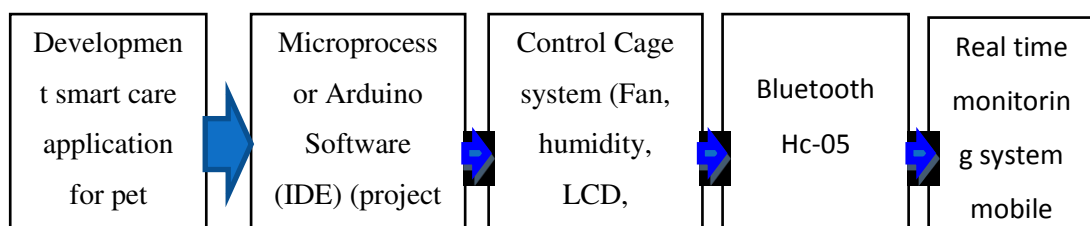


Figure 1.1: Project Diagram Smart Care Application System for Pet.

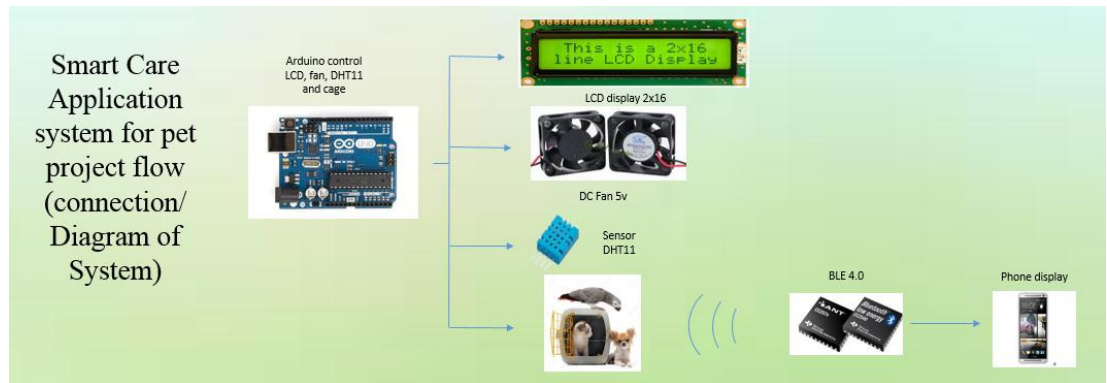


Figure 1.2: Project Flow (connection/Diagram of System)

1.5 Project Significance

This project will give the most benefit to users in a wide range of industries, especially to the veterinary company. The veterinary company could develop and implement this project in order to provide better product performance and convenient to the users. This project is easy to implement and also low cost.

1.6 Summary

Pet traumatized emotions disturbed due to noise disturbance from the dryer. Smart care application system for pet by using microcontroller is introduced to overcome this problem in modern technology life. In this chapter are covered about the background, the problem statement, the objectives, and the scope of work and the project significance of this project.

CHAPTER 2

LITERATURE REVIEW

The characteristics and some information of the equipment and materials being used in the project are discussed in this chapter. This chapter explains literature review based on current and exist technologies and information has been done in order to create a specific research about this project. Research hypothesis is been described clearly. From literature review, there will be an analysis regarding the advantages and disadvantages for each phase of this project. The research topics that had been discussed in this chapter are about basic smart care application such as equipment, software and so on.

2.1 Type of Dryers

2.1.1 High Pressure pet Dryers (Forced-Air Dryers and High velocity dryers)

High pressure Pet dryers for pet are pieces of equipment that operate with the same concept as hairdryers, except these are designed for pet fur and are quieter than the hair dryers we're used to. Some pet's get spooked by loud noises, so these dryers are designed to quietly and thoroughly get our pet dry and ready for the next step (clipping). While part of the drying process will be done with a towel—and there are some nice microfiber absorbent ones—the

rest of the drying process will be most convenient if we have some mechanical help.

Figure 2.1 show that the Flying Simple Grooming Dryer (Forced –Air Dryer) makes drying furry friend(s) of all sizes an easy task. The specification of lightweight, portable, durable dryer features two switches that allow to comfortably adjusting the speed and heat levels. This dryer can saves efficiency grooming time by up to 60 percent and very slim. The design of the 120-inch stretchable hose and handle placement, gives the capability to maneuver it effortlessly while protecting hands from the selected heat option. By a quick snap on and off clasp, we can customize the dryer with the included three various size nozzles, which will give a different grooming experience. Due to removable filters, this dryer is easy for maintaining cleanliness and keeping pet hair out. With its efficient and powerful function, the dryer is suitable for any pet.



Figure 2.1: Flying Simple Grooming Dryer (Forced –Air Dryer)

Figure 2.2 show that The B-Air Bear Power I Dryer (High Velocity Dryer) offers powerful drying capability in a light weight and easy to carry size. Constructed of high-impact ABS plastic for durability, the Bear Power I weigh in at only 7.8 lbs. The two-speed motor is insulated for quiet operation. The high RPM on the turbine motor warms the air by approximately 20 degrees Fahrenheit without a heating element. Rubberized feet keep the unit stable during operation. Removable filters are washable for easy cleaning and

keep the unit free of pet hair and debris. The Bear Power I come with a set of four nozzles. The slot nozzle is for long coated pets to prevent knotting while drying. The cone is used for the deepest drying and is great on very thick coated dogs. The brush nozzle is designed for deseeding the coat. The airflow nozzle allows more airflow for drying small dogs, cats, and sensitive areas such as ears and face. This is a compact and light weight with a built-in handle, the Bear Power I can go anywhere. C-ETL-US Approved. Specifications 2 HP, 115V motor 33,000 FPM 7.4 amps Two speeds 7.8 lbs 6 foot hose 165 CFM 10 foot cord. (Joanna Ehlers, 2013).



Figure 2.2: show that The B-Air Bear Power Dryer (High Velocity Dryer)

2.1.2 Low pressure dryers (Stand Dryers, Cage Dryers)

Low pressure dryers also known as carpet dryer, or cage dryer, this particular type of dog dryer is composed of a large blower that produces a lot of air flow at a very low pressure. This is a gentle way to dry sensitive dog coats. Many low pressure dog dryers come with an auxiliary heater to warm up the air flow and dry the fur faster.

Figure 2.3 show The Oster Hi-Velocity Adjustable Table and Cage Dryer (Stand dryers) is made by a pet-grooming leading manufacturer, Oster, and offers a sturdy dryer with a heating element that can turn off (perfect!) and an ideal design to use on your grooming table or as a cage dryer. For added safety, there is a special overload switch preventing it from overheating. (@lazharichir, 2016)



Figure 2.3: Oster Hi-Velocity Adjustable Table and Cage Dryer (Stand dryers)

Figure 2.4 show the cage dryer room. The cage dryer concept saves labor compared to hand drying, and is appropriate for most types of coats and cuts. Temperature control adds a safety factor far beyond other hands-off drying setups. The air temperature is regulated and uniform within the compartment - there are no hot spots. Furthermore, the operator judges what temperature is appropriate for the animal inside, and sets the exact temperature in degrees Fahrenheit. Setting "fan only" dries without any heat at all.



Figure 2.4: show the cage dryer room