



**SMART DUSTBIN**

**NURFARAHIN BINTI MOHAMED  
ZAFIRAH BINTI ZAINUDDIN**

**TX  
656  
.N87  
2015**

**FACULTY OF ELECTRICAL ENGINEERING  
UNIVERSITI TEKNOLOGI MARA  
MALAYSIA**

**MARCH 2015**

## **ACKNOWLEDGEMENT**

In the name of Allah, The Most Loving and The Most Compassionate First and foremost, we would like to thank the god for giving us strength, good health condition during our final year semester in University Technology of Mara, Pasir Gudang Campus. Thanks to Him to giving us a well physical and mental in order to complete this final year project.

This project will not complete if there is no supportive partner. Thank to my partner for the contributions. The energy, knowledge and moral support for complete this project. From this project, we shared our problems, ideas, creativity and laughter together in process to complete this final year project.

A successful final year project is not an individual endeavor. In particular, we wish to express our sincere appreciation to our supervisor, Miss Nurlina Binti Mohd Zain, for encouragement, guidance, critics and friendship that we have built together for this whole year.

We would never have been able to make this accomplishment without loving support from our family. The fund given from our family to support us from brought all the material to accomplish the final year project. The motivation when we are stress while doing the final year project.

And the last but not least, thanks to all our friends that giving a hand to help us. The colleagues and all the lecturers that have assist us and help with many ways to fulfill the requirement needed in this project. In the last words, we are grateful for having all of you besides us, thank you very much.

## **ABSTRACT**

Microcontroller is the device is powerful device. Nowadays, the good things are the powerful component, microcontroller is one of the component best components and it is basically very simple. Microcontroller is the brain of any electronic devices. It is a simplest computer processor main brain for the future system. It has many type of microcontroller from the lowest to the higher number of pins with so many functions at the pins. It is need simple software to control it all and everyone can easily learn about has been developed.

The microcontroller has a large number of different types and software but it has many common similarities. When the power supply is turned off the program is loaded into the microcontroller. When the power supply is on everything is start at the high speed. The control unit is take part to keep under control. Then it disables all other circuit except the quartz oscillator. Power supply reaches the maximum and oscillator frequency become stable and all the pins are configured as the inputs. The overall electronics start operation in rhythm with pulse sequence. Microcontroller is compatible with any assembly language. The special feature of the microcontroller is it has Read Only Memory (ROM). ROM is the permanently memory and save permanently program being executed.

Unlike the integrated circuits, microcontroller has been programmed first. This is why many of electronics engineer do not use microcontroller. But actually the programming for the microcontroller is very simple. In these recent years, the technologies are move faster than before. Many applications have been invented for making life easier by using microcontroller. Microcontroller can be applying in the robotics, toys and house appliances. Microcontroller is widely used for inventor. Nowadays, even the primary and secondary schools are study about the microcontroller. People that are able to use microcontroller make it as a hobby to make a programming. By using the microcontroller they able to make such an interesting project and does not require so much cost because microcontroller are cheap. Microcontroller are do it yourself project because it small and easy to carry and the software for the microcontroller is can be install in the personal computer.

## TABLE OF CONTENTS

ACKNOWLEDGEMENTS

ABSTRACT

LIST OF FIGURES .....	1
<b>CHAPTER 1 INTRODUCTION.....</b>	<b>4</b>
1.1 Background of Study.....	4
1.2 Problem Statement .....	4
1.3 Objective of Research .....	5
1.4 Scope of Study .....	5
<b>CHAPTER 2 MATERIALS AND METHODS.....</b>	<b>6</b>
2.1 Methodology .....	6
2.2 Equipment and Component.....	8
2.3 Software .....	17
<b>CHAPTER 3 CIRCUITS DESIGN AND OPERATIONS.....</b>	<b>20</b>
3.1 Schematic Diagram and Circuit Operations .....	20
3.2 PCB Design.....	31
<b>CHAPTER 4 RESULT AND DISCUSSION.....</b>	<b>32</b>
4.1 Software Simulation Results.....	32
4.2 Hardware Implementation Results.....	46
4.3 Circuit Testing and Troubleshooting .....	51
4.4 Data Analysis and Discussions .....	53
<b>CHAPTER 5 CONCLUSION AND RECOMMENDATIONS .....</b>	<b>55</b>
5.1 Conclusion .....	55
5.2 Recommendation .....	57
REFERENCES .....	58
APPENDIXES .....	59

## CHAPTER 1

### INTRODUCTION

#### 1.1 Background of study

This project is to aim to design and develop the “Smart Dustbin”. This electromechanical dustbin is a new invention of that is controlled automatically by using microcontroller (PIC). The advantages of this electromechanical dustbin are user friendly and in addition safe where it can avoid human interference to the dustbin. This project is combination electrical and electronic engineering field to represent the new invention which is regarding the design and development process.

#### 1.2 Problem Statement

This present, there are too many dangerous diseases such as dengue and malaria. This is because when human forget to close the dustbin, any animal like mosquito and flies will come and lay their eggs. This situation can make environment become dirty and can lead to disease.

Then manual dustbin needs physical contact that can lead to dangerous diseases. This is because usually children will forget to wash their hands after throw rubbish. So by using smart dustbin, it can minimize the spreading of bacteria. It also can minimize the human interference in collection and disposal of trash.