



**FACULTY OF ELECTRICAL ENGINEERING  
UNIVERSITI TEKNOLOGI MARA  
PULAU PINANG**

**FINAL REPORT:  
AUTOMATIC BATHROOM LIGHT AND EXHAUST FAN  
CONTROL**

**JOSEPH MALCOLM ANAK JEFPRIN  
2014611446**

**RALSTON GLAYANT ANAK TEREANCE TARANG  
2014688284**

**NORNABILAH BINTI NORZRIN  
2014685594**

**SEMESTER JUNE – OCTOBER 2016**

# TABLE OF CONTENT

ACKNOWLEDGEMENTS

ABSTRACT

LIST OF

FIGURES.....1

LIST OF

TABLES.....2

LIST OF

ABBREVIATIONS.....3

## CHAPTER 1

**INTRODUCTION.....4**

1.1 Background of Study.....4

1.2 Problem Statement.....5

1.3Objective of the Research.....6

1.4Scope of Study.....6

**CHAPTER 2 MATERIALS AND METHODS.....7**

2.1 Methodology.....7

2.1.1 Final Year Project Flow Chart .....7

2.1.2 Project Flow Chart.....7

2.1.3 Block Diagram.....8

2.2 Experimental Setup.....9

2.3 Equipment and Component.....11

## **ACKNOWLEDGEMENTS.**

First and foremost, we would like to offer our sincerest gratitude to our supervisor, Madam Rohaiza Baharudin for the full support, motivation, cooperation, encouragement and constructive suggestion in order to succeed our project.

This final year project report was prepared for Faculty of Electrical Engineering in Diploma, Universiti Teknologi MARA, Pulau Pinang for student in final year to complete their Diploma. This report is based on the methods and guidelines given by the university.

We would like to give thanks to the staff laboratory member of UiTM, who gave us the permission to use all required machinery and the necessary material to complete the Printed Circuit Design board.

Last but not least, deepest thanks to our parents, family and others for their support in term of budget for report completion from the beginning till the end. I offer my regards and blessings to my colleagues and all of those who supported me in any respect during the completion of the project.

## ABSTRACTS

The project titled “Automatic Bathroom Switch Light and Exhaust Fan” has been chosen as the Final Year Project. Lately, automatic control systems have become a necessary and a trend to make the lifestyles easier.

According to the project, it is beneficial to save electrical energy in the daily lives to reduce the electrical energy consumption that will prevent major financial loss. The Automatic Light Switch and Exhaust Fan also benefits in terms of time management as the light and switch doesn't need a switch to light up.

The Automatic System uses Motion Sensor to replace the switch for the lights and fan. The system operates when the sensor detects the presence of motions in the bathroom. If there are motions in the bathroom, the Light and Fan will “ON” while if there is no motion detected, both will “OFF”.

In “ON” condition, the system works when Motion Sensor detects movement, it will send signal to the relay that acts as a logic switch before transmitting to the light and motor. After that, the timers will counter the time signal from the relay and provide the output which is the Light and Motor will “ON” but in “OFF” condition, the relay will be an open circuit thus blocking the output result.

In conclusion, this system is ideal for modernizing a house, apartment or place with disabled people. This system has a lot of benefits and will bring a bright future to the mankind in the future.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of Study

For more and more people, automatic control systems have become a necessary part of their home and they wouldn't dream of living in a home without one. This trend can be directly traced from the life style and daily routine which is always busy with works. As human activities increase and continued to be on the ascendance. Based on increase in human activity, level of electricity consumption has become a major index being used in measuring the level of development of nations world nowadays. [1]

However, despite the important attached to electricity, it has remained one of the most wasted and abused resources. It is not uncommon to see system left ON in unoccupied homes, office, and classrooms for many hours. People nowadays always want something that can make their life easier. Bathroom power consumption makes up the largest part of energy consumption in the world. In particular, the power consumption of lamps and exhaust fan in a typical home is a factor which can't be ignored. Sometimes the light intensity from outside is sufficient, and thus people don't need to turn ON any light. But sometimes the user leaves but forgets to turn OFF the light. [2]

Besides that, some exhaust fans operate continuously and many operate when not necessary. It is important to turn exhaust fan OFF when they are not serving a useful purpose. There may be opportunities to more efficiently control exhaust fans in areas such as bathroom, restroom, laundry room and other location. These factors cause energy waste. Better control of light and exhaust fans not only saves the electricity required to operate the fans and light but also the cost of conditioned air for the surrounding that is exhausted unnecessarily.

Therefore, this project proposes a design for bathroom light and exhaust fans as behaviour awareness that to keep the system OFF when both of it not in use.