

Universiti Teknologi MARA

**AUTOMATED RECYCLE GARBAGE BIN
MANAGEMENT SYSTEM FOR F&B COMPANY**

Muhammad Hafiz Bin Zahrullail

**Thesis submitted in fulfillment of the requirements for
Bachelor of Science (Hons) Data Communications and Networking
Faculty of Computer and Mathematical Sciences**

JANUARY 2019

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful. Alhamdulillah, praise and thanks to Allah SWT, for all the graces and blessings and also Selawat and Salam to the Prophet Rasulullah SAW, hopefully His syafa'at will be abundant in days later.

First of all, I would like to express my highest gratitude to my supervisor, Pn Siti Arpah Binti Ahmad for her guidance, advice and support in order to complete this final year project. I appreciate every single "walk" she taught me.

Thanks also to all the lecturers in the course of Bachelor of Science (Hons) Networking & Data Communications at UiTM Shah Alam for their patience and kind advice during the process of completing the project.

Lastly, thanks you so much to all those who supporting me in any way during the completions of this proposal report by discussing, sharing or exchanging ideas and everyone who are directly or indirectly involved in writing this report.

Thank you so much.

ABSTRACT

“AUTOMATED RECYCLE GARBAGE BIN MANAGEMENT SYSTEM” is one of the smart bin that play important role to enable time-saving and capable of doing recycling process in the meantime. Normally, the garbage bin in the F&B company is manually operate either using the feet or hands to open the lid of a garbage bin, and it will be difficult for people who hands is full with other things or for disable people to dispose of waste. In addition this smart bin is provided with advanced feature that could monitor the bin by using the mobile application so that it could aid the management of cleaning in a F&B company itself. This could prevent from the problem of trash filled up and overflowing that are not managed well. The bin also help in managing the type of the trash that were thrown in by organizing according to its type. This could help the workload of the worker which needed to separate the garbage. The project will operate when the sensor that located on the front of the trash can detect or identify an object approachin and automatically open the lid of the bin in a few seconds, after which it will closed again. In the process, the bin will operate to identify the type of the trash and then it will separate the garbage according to its type by using the sensor to detect its type. If the trash is full, the bin will give an alert to the user through the mobile application and inform them to management of cleaning. The smart bin also will automatically turned off when the bin is full and does not operate when there is an object approaching the trash can. The system itself is still imperfect with certain limitations and possible future works will also be discussed.

TABLE OF CONTENTS

CONTENTS	PAGE
SUPERVISOR’S APPROVAL	I
DECLARATION	II
ACKNOWLEDGEMENT	III
ABSTRACT	IV
TABLE OF CONTENTS	V
LIST OF TABLE	VII
LIST OF FIGURE	VIII
LIST OF ABBREVIATION	IX
CHAPTER 1 : INTRODUCTION	
1.1 Background Study	1
1.2 Problem Statement	2
1.3 Project Aim and Objective	3
1.4 Scope of Project	3
1.5 Significant of Project	4
CHAPTER 2 : LITERATURE REVIEW	
2.1 Introduction	5
2.2 Sensors	5
2.2.1 Ultrasonic Sensor	5
2.2.2 Infrared Sensor (IR)	7
2.2.3 Maxbotix Sensor	9
2.2.4 Capacitive / Inductive Proximity Sensor	11
2.3 Arduino Uno	13
2.4 Related Work	14
2.4.1 A Low Power IoT Sensor Nide Architecture for Waste Management Within Smart Cities Context	14
2.4.2 Multi-Agent Based IoT Smart Waste Monitoring & Collection Architecture	15
2.4.4 Smart Dustbin for Economic Growth	15
2.5 Summary	17

CHAPTER 1

INTRODUCTION

This chapter provides background study for the proposed project and provides details about the problem that are faced by F&B company. This chapter also consists of the objectives that need to be achieved in this project. On this chapter, will also provide the scope of the project and the significance of doing the project.

1.1 BACKGROUND STUDY

In spite of the fact that the human population is increasing thus it will lead to increasing of waste production. Piles of rubbish are one of the major problems faced by most people in Malaysia, especially those who live in flats, as the number of bins is limited and shared among all residents [Aiman Zakwan, 2016]. According to the research made by The Ocean Legacy Foundation, there are over 220 million tons of plastic are produced each year and only 9% of it is recycled properly. Plastic can contribute to reduce our carbon footprint. This project is created to develop a smart garbage bin that could organize the waste properly on its own and alert the user when the level of waste in the garbage bin is full.

There are several issues faced by the travelers. One of them is the domestic solid waste disposal, which causes pollution [A.F. Thompson, 2013]. Unlike landed houses, the hotels waste disposal bins are shared among all visitors which accommodate in the same building, and thus, the bins tend to be filled very quickly. Thus, an unsystematic and inefficient disposal waste management may cause the bins to be always full of garbage, and further littering from the customers will cause the garbage piles to be scattered outside the bins. Therefore, there will be a question of sanitary as those garbage piles may become the root cause of illness and diseases like dengue, diarrhea, and cholera.

Besides, there are also problems regarding the attitudes of each inhabitant of the customers. There are cases where some irresponsible customers, who normally stay at the higher levels