



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**DEVELOPMENT OF SMART DUSTBIN BY USING
APPS**

This report is submitted in accordance with the requirement of the Universiti Teknikal
Malaysia Melaka (UTeM) for the Bachelor of Computer Engineering
Technology (Computer System) with Honours.

by

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940915-03-6248

FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING TECHNOLOGY

2018

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

Tajuk: DEVELOPMENT OF SMART DUSTBIN BY USING APPS

Sesi Pengajian: 2019

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APPROVAL

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ABSTRAK

Projek ini bertajuk Pembangunan Tong Sampah Pintar dengan menggunakan sebuah Aplikasi. Arduino adalah sebagai pengawal antara sensor ultrasonik, buzzer, motor dan Modul WiFi. Projek ini dilaksanakan supaya pengurusan jabatan pembersihan atau pembersih dapat mengetahui tentang limpahan sampah di tempat-tempat tertentu. Tong sampah ini sangat berguna dalam kehidupan seharian dan penting untuk semua peringkat orang sama ada orang muda, tua, mempunyai kecacatan anggota badan atau sesiapa sahaja yang menggunakan tong sampah untuk membuang sampah. Pembersihan dan pengurusan jabatan pembersihan yang tidak mengambil perkara tong sampah yang melimpah sebagai isu yang serius dan juga tidak mendapat maklumat tentang limpahan menjadi sebab mengapa sistem ini dilaksanakan. Oleh itu, ini adalah sistem yang sangat penting untuk dilaksanakan terutamanya di bangunan seperti pasar raya. Projek ini mula berfungsi apabila ada orang yang datang berhampiran dengan tong sampah untuk membuang sampah di mana ia akan dikesan oleh sensor ultrasonik dan motor akan membuka penutup tong sampah. Tahap sampah di dalam dapat dilihat melalui Aplikasi Blynk. Ia akan menunjukkan tahap yang dipenuhi dengan sampah dan ruang kosong. Sebaik sahaja tahap sampah mencapai tahap tertentu, amaran peringatan akan dihantar ke jabatan pembersihan untuk memberi amaran bahawa tong sampah akan penuh. Satu lagi pemberitahuan akan dihantar sebaik sahaja tahap sampah mencapai tahap maksimum untuk mengambil tindakan segera untuk mengutip sampah melalui Aplikasi Blynk dan buzzer mula berbunyi.

ABSTRACT

This project entitled Development of Smart Dustbin by Using Apps. Arduino as a controller between ultrasonic sensors, buzzer, led, fan and WiFi Module. This project implemented so that cleaning department management or cleaners can be aware with the overflow of rubbish of a dustbin at certain place. It is very useful in daily life and important for all level of people either young, old, disable people or anyone who using the dustbin to throw rubbish. Cleaners and cleaning department management who does not take the matter of the dustbin as a serious issue and also did not get information on the overflow of dustbin become the reasons why this system is implemented. Thus, this is a very important system to be implemented mainly at the indoor buildings such as supermarket. The project started to work when there is a people coming near to the dustbin to throw rubbish where it will be detected by the ultrasonic sensor and motor will be open the cover of the dustbin. The level of rubbish inside can be seen through the Blynk Apps. It will show the level of occupied with the rubbish and empty level. Once the level of rubbish reached a certain level a reminder notification will be send to the cleaning department to give a warning that dustbin going to be full. Another notification will be send once the level of rubbish reached maximum level to take immediate action to collect the rubbish through the Blynk Apps and buzzer started to give beep sound.

DEDICATION

To my beloved parents, thanks for the help, concern and understanding while I'm in developing this project.

ACKNOWLEDGEMENTS

I would like to thank my supervisor, Dr Jamil Abedalrahim Jamil Alsayaydeh for his guiding during my final year project period so that I will be able to do through the Bachelor Degree Project I and Bachelor Degree Project II subject successfully. Besides that, I would like to give my appreciation to my final year project panels, Madam Dayanasari Binti Abdul Hadi and Dr Suhaila Binti Mohd Najib for giving their time to observe my presentation and evaluate my work. I want to thank them because giving a recommendation and advices in this project.

In addition, I would like to thank to my beloved family. My father Mr. Jayasundar and my siblings for their understanding and giving support during my hardship. Thanks also to them for their patience to understand me.

Lastly, I would like to thank my beloved friends at Universiti Teknikal Malaysia Melaka who giving me support, advices, and help me when I need them throughout my project.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

This chapter will explain about fundamental idea together with development smart dustbin by using Apps. It focused on the background of the project, the problem statement, detailing the objectives and project scope, project significance, expected output and project organization. In addition, the explanation regarding this project system and working principal of the system will be explained in this chapter. Moreover, the beginning of the preparation for this smart dustbin by using Apps will be highlighted also in this chapter one. This is also one of the important sections for the user as it will be the guidelines for the users. Lastly, developer can achieve their goals based on the parts that are included in this chapter with a clear specified statement stated.

1.1 Background Of The Project

In this era, most of the people prefer to shop at the supermarket. This is because as there are a lot of choices of goods from the household things until the raw things. As there are many people keep on visiting the supermarket, there also a lot of rubbish started to be generated. Hence, this lead to the dustbin cannot cope with the rubbish and sometimes the dustbins are overflow. This type of situation not only happens at the supermarket but at the most of the places. This problem happens due to the cleaning department not very sensitive to this matter of the dustbin full of rubbish and also overflow. The dustbins which are full and overflow not collected on time by the cleaning department. Therefore, to overcome this matter here come the idea of develop a smart dustbin by using Apps. Whenever the dustbin is full, an alert notifications is sent to the cleaning department for quickly pick up the rubbish.

Development of Smart Dustbin by using Apps is a high performance programmable smart dustbin using Apps. Apps is a system which it combines the knowledge in the field of telecommunications and computing. This smart dustbin started to work once a person nears the dustbin. The ultrasonic sensor used to detect the person when they come near to the dustbin. Then, the dustbin will be automatically open. People no need to use their hands or leg to open the cover of the dustbin to throw the rubbish. When the dustbin is going to be full then a reminder notification will be sent to cleaning department. Once the dustbin with rubbish reach a maximum level buzzer will give a beep sound and at the same time it will sent an alert notification through a communication link which is Blynk Apps to the cleaning department.

1.2 Problem Statement

Nowadays, the planet is moving very quick alongside with fast stream in innovation. Along with it, human beings need to move quickly so that they are not misses out a great opportunity by innovation that accessible on the planet today. Currently with the changing of time we have to make a few applications or item that extremely helpful for all level of society without think of their status either old, young or anything.

Presently if see at the supermarkets a lot of the dustbins are physically worked and most of it utilize using leg and furthermore use hand to open the dustbin. This can enable people to throw rubbish. But it gives trouble to the person with disabilities where sometimes they are some disabilities people who need help to open and throw the rubbish. It is a not user-friendly dustbin as it is only can be used by the normal people and not the person who are with disabilities.

Besides that, at the indoor places such as supermarket, bank, hospital and other places there are many dustbins which are placed inside which it is easy for the people to throw the rubbish. Unfortunately, sometimes when the dustbin is full or overflow there is slow action from the cleaning department to collect the rubbish. This situation happens because the cleaners do not get information on the overflow

of the rubbish of the dustbin. The old fashion still used for monitoring the dustbins and it is not really efficient nowadays.

Besides that, as the population is increasing the problem of cleanliness towards the garbage management degrading dramatically. Because of this it creates an unhygienic situation around the surrounding or environment. Moreover, this also creates ugliness of the environment and at the same time causing unwanted diseases. Bad smells also are spread over and it degrades the valuation the area.

Thus, with the development of this smart dustbin by using Apps which is Blynk the rubbish will not allow it to overflow over the dustbin. The cleaners will collect the rubbish once get information or order from the cleaning department. The cleaner no need to waste their time by always checking the dustbin whether the dustbin is full with rubbish or not.

1.3 Objectives

There are three objectives which carried out from this project to make it successful.

The objectives are:

1. To build up a model of a smart dustbin observing a system, once the junk in the dustbin is reached a maximum level it will consequently identifies by sensor system.
2. To build up a system which can passes data from one location to another location without any restriction.
3. To use the communication system for send the data information for developing this project and at the same time provide a friendly use of system.

1.4 Scope

The scope of this project is that to build an embedded system which will work properly based on the objectives and the problem statement faced in this project. This project main focus is on monitoring the dustbin at the indoor building or places. Besides that, this undertaking is to make simple for cleaner to gather the trash without misuse of their chance and they will come gather the trash once get a notification.

Next, this project will use Arduino as it can and able to control the sensors, motor and Apps to make this system to operate according the flow of system. In this project both combination of software and hardware will be used. The role of software is it will be apply to operate the components and emit the action of the Blynk Apps. It is to form relationship between dustbins with cleaning department.

In simple word the scope of project is as follows:

- The focus of this project is at indoor building or places.
- This smart dustbin will start to work once people coming near the sensor and automatically dustbin cover will open.
- Smart dustbin will only pass or sent a reminder and alert notification to cleaning department management.
- This is user-friendly project that can use for various levels of people

1.5 Project Significance

Project significance is the expectation of this project. This project expected can solve rubbish problem that not collected and make the ease for monitoring the dustbin. This dustbin can be used by all range and type of people where it becomes the user-friendly dustbin. Waste can gather by the cleaners after get data that dustbin is with full of rubbish, so this will spare time for them to the gather trash by not going to the dustbin and make checking. So, this can help the cleaners to do different work and not pay attention to gather the trash in without fail. Once the wastes are rapidly and quickly gathered this can evade from the spreading of microbes. Other than that, this venture can likewise guarantee trash can be gathered as quickly as time permits without enabling it to overflow. At the point when garbage not gathered it will influence the perspectives and furthermore will create scent contamination. From this task it can take care of the issue that looked by the administration of cleaning. Other desire for this undertaking is utilize the new application or framework that is Blynk Apps for observing the full trash. This undertaking will turned into the one of the task can help individuals for their benefit.

1.6 Project Organization

This part is simply briefing about the next chapter that will be conducted in this project report. The next chapter is literature review. Literature review demonstrates on further analysis related to the selected project that going to be implemented.

CHAPTER 2

LITERATURE REVIEW

2.0 Chapter Overview

In this part, surveys of the past inquires about undertaking that are connected with this venture will be examined. The data will be turned into extra document for the undertaking in winding up more effective. To have a short comprehension of inquires about identified with the task, a couple of writing surveys had been finished. This is for gain extra knowledge and information that related with this project. The information is taken from the journals, books, articles and also internet resources. Besides that, for this project of studies, the information about sensors, buzzer, Arduino and GSM will be summarized in this chapter. This chapter will describe the related literature reviews.

2.1 Waste Management

In this modern together with super advanced technology day and the fast development in the human population, the waste problem has become one of the worst environmental problems in many of the countries. The reason of this problem occurs is due to the way of controlling waste collection and management in the country where the waste are not managed efficiently and effectively. Wastes are created from different types of sources where it could cause the environmental pollution. It also can give a risk to the health. Lack of proper management solutions is one of the big difficulties in managing the landfill for the liable party. Therefore, to get more information of the collection and management of the waste there are some interviews and site visits which were conducted. It was conducted by the company which are responsible for the waste management (Behzad et al. 2011).