POLITEKNIK

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DESIGNING A SMART RUBBISH BIN MONITORING SYSTEM WITH IoT

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JABATAN KEJURUTERAAN ELEKTRIK

NOVEMBER 2021

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FARINA BINTI FATHOL JAWAD	08DJK19F2002

This report submitted to the Electrical Engineering Department in fulfillment of the requirement for a Diploma in Electrical Engineering

JABATAN KEJURUTERAAN ELEKTRIK

NOVEMBER 2021

CONFIRMATION OF THE PROJECT

The project report titled "Design a Fingers Exergame to Improve Fine Motor Skill for Autistic Children Using Arduino" has been submitted, reviewed and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

Checked by:

Supervisor's name : MR. IDRIS B. KAMARUDDIN

Supervisor's signature:

Date :

Verified by:

Project Coordinator name :

Signature of Coordinator :

Date :

"I acknowledge this work is my own work except the excerpts I have already explained to our source"

1. Signature :

Name : **FARINA BINTI FATHOL JAWAD**

Registration Number : **08DJK19F2002**

Date :

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : DESIGNING A SMART RUBBISH BIN MONITORING SYSTEM WITH IoT

SESSION: SESI 1 2021/2022

1. I, **1. FARINA BINTI FATHOL JAWAD (08DJK19F2002)**

   is a final year student of **Diploma in Electrical Engineering, Department of Electrical, Politeknik Sultan Salahuddin Abdul Aziz Shah**, which is located at **Persiaran Usahawan, 40150 Shah Alam, Selangor**. (Hereinafter referred to as 'the Polytechnic').

2. I acknowledge that 'The Project above' and the intellectual property therein is the result of our original creation /creations without taking or impersonating any intellectual property from the other parties.

3. I agree to release the 'Project' intellectual property to 'The Polytechnics' to meet the requirements for awarding the **Diploma in Electrical Engineering** to me.

Made and in truth that is recognized by;

a) **FARINA BINTI FATHOL JAWAD**) .
(Identification card No: - 010822140264) ....…….
) **FARINA BINTI FATHOL JAWAD**

In front of me, **MR. IDRIS B. KAMARUDDIN**) .....……
(Click here to enter text.)) **MR. IDRIS B. KAMARUDDIN**
As a project supervisor, on the date:

ACKNOWLEDGEMENTS

I have taken efforts in this Project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them. I am highly indebted to SIR IDRIS B KAMARUDDIN for his guidance and constant supervision as well as for providing necessary information regarding the Project & also for their support in completing the Project.

I would like to express my gratitude towards my parents & my classmates for their kind co-operation and encouragement which help me in completion of this Project. I would like to express my special gratitude and thanks to industry persons for giving me such attention and time.

ABSTRACT

Waste management may seem like an unimportant matter because people have been taking this problem very lightly. In certain housing areas and public places, such as shopping mall, lake and apartment, this issue is not given enough thought on how to have a systematic waste management. A lousy waste management system may cause tons of pollution to people such as smell pollution that comes from the rubbish. Also, the risk of sickness and diseases will also increase because it is a known fact that rubbish attracts pests if the rubbish were left outside too many days. This project presents the development of a smart garbage monitoring system in order to measure waste level in the garbage bin in real-time and to alert the person in charge. This paper proposed IOT based smart waste clean management system which checks the waste level over the dustbins by using Sensor systems. in this IOT Project, an Ultrasonic Sensor is used for detecting whether the trash can is filled with garbage or not. Here Ultrasonic Sensor is installed at the top of Trash Can and will measure the distance of garbage from the top of Trash can and we can set a threshold value according to the size of trash can. If the distance will be less than this threshold value, means that the Trash can is full of garbage and we will print the message "Basket is Full" on the webpage and if the distance will be more than this threshold value, then we will print the message "Basket is Empty". With an addition of LCD display that were attach on the front of basket to give an indicator whether the rubbish bin is full or not. Hence, with this project, we can achieve a great results regarding the waste management issue in our country an strive for a clean environment for everyone.

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INTRODUCTION

1.1 Introduction

Waste management is a long-time issue that is yet to be solved by developing countries. There are five typical problem areas that is identified by Municipal Solid Waste Management (MSWM) of developing countries which are inadequate service coverage, operational inefficiencies of services, limited utilization of recycling activities, inadequate management of non-industrial hazardous waste and lastly, inadequate landfill disposal. Fixing and solving this problem totally will certainly requires time, help and support from people all over the world which obviously a pretty hard thing to achieve. Besides, I do believe that small change or effort can help the world to prevent this problem from getting worse. This project suggests a possible approaches for improving the situation. Emphasis will be on the ways to limit the time and effort to collect the rubbish.

1.2 Background Research

Waste collection is a part of the process of waste management. It is the transfer of solid waste from the point of use and disposal to the point of treatment or landfill. Waste collection also includes the curbside collection of recyclable materials that technically are not waste, as part of a municipal landfill diversion program.

Waste collection considerations of waste during different types of waste and size of bins, positioning of the bins, and how often bins are to be serviced. Overfilled bins result in rubbish falling out while being tipped. Hazardous rubbish like empty petrol cans can cause fires igniting other trash when the truck compactor is operating. Bins may be locked or stored in secure areas to avoid having non-paying parties placing rubbish in the bin.[3] The cost of old waste is also a concern in collection of waste across the globe.

1.3 Problem Statement

- Waste management in certain workplace, housing area or even public places are very poor. Sometimes, we can see that the rubbish bin that is provided is overflowing with rubbish and very much spoiling the scenery. Collecting rubbish or waste from rubbish bin was still dependant to people to do the job.
- Focusing on the public space, cleaners or workers usually make rounds and checking every rubbish bin to make sure its not overflow and empty for the visitors to use. This surely takes time and effort as majority of public places are large and wide. It may take several hours for the workers to finish the job.
- If this project is applied to the waste management system in public places, we can have more systematic rubbish collecting system for the cleaners. They can just check the location which rubbish bin is full and just go pick up the rubbish bin in the specific rubbish bin instead of going through every rubbish bin.
- The visitors can also know whether the rubbish bin is full or not by just seeing the indicator that comes with the rubbish bin. This way they don't have to open the lid of the rubbish bin to know if the rubbish can fit in or not. Hence, hygiene matter for both visitors and workers can be maintained and prevented.
- With this invention, we can limit the time and effort spent to collect the rubbish by the cleaners. Even if collecting rubbish is their job scope, we should still help lighten the burden by inventing a project that is systematic and easy to understand.

1.4 Research Objectives

The main objective of this Project is the protection of the environment and the health of the population emphasize on the garbage collection method that have to be thought thoroughly as it can affect all people.

More specifically the objective of this research are:

- Limiting the cost, time and effort just for the purpose of collecting rubbish
- Have more clean and systematic waste management
- Hygiene problem and issues can be prevented

1.5 Scope of Research

- Determines the project scope
- Scope of the project should be specific, measurable and realistic
- Constraints define limitations for project including time, resource and performance
- For example: Project will be completed within 20 days, cost of developing project is RM350.00, hardware resources are available for two months
- Completing the documents
- Working on the software
- Buying and preparing the materials and components
- Started on the hardware
- Attaching it on the rubbish bin
- Testing and troubleshooting

1.6 Project Significance

When waste is disposed of or recycled in a safe, ethical, and responsible manner, it helps reduce the negative impacts of the environment. Ensuring that waste management procedures are carried out with regularity helps ensure that fewer waste materials go to the general waste stream.

Its our responsibility to do something for the sake of our nature. This project may seem not that crucial but with this small effort we might help the future of the next generation. It can also be the start and a new door for the greater invention to help people live an easier and comfortable life.

1.7 Chapter Summary

This chapter specified the reason and problem that I am trying to focus on. This issue might not so crucial in people's eyes but if not taken seriously from now, it might cause a greater fuss in the future.