SMART DIGEST DUSTBIN

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PULAU PINANG

JABATAN KEJURUTERAAN ELEKTRIK

SMART DIGEST DUSTBIN

"I / We hereby declare that I have read this thesis and in my / our * opinion this thesis is sufficient in terms of scope and quality for the award of the Diploma in Electronic (Communication Engineering)

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PROJECT REPORTCOMFORMATION

We hereby declare that the work in this report are we except for quotations and summaries which have been duly acknowledged.

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Dedicated to,

Thanks to Allah,

For give us a good health and strength while making this report.

My beloved father and mother,.

Who has always been our epitome of love and always pray for our strength to finish up this report.

Our beloved relatives,

Our siblings,

Thank you for your support and pray.

The person who has been very understanding and helpful,

PN.NURHAFIZAH BINTI ZAKARIA

For the support and guidance. Hope that us always be remembered.

Our unforgettable friends,

Our housemate, our coursemate and all DEP students intake June 2015,

Our struggle not yet ends.

Finally, friends that always together during this third years study, hopefully achieved what we aspired.

ABSTRACT

Most people don't realize how much food they throw away every day, from uneaten leftovers to spoiled produce. About 95 percent of the food we throw away ends up in landfills or combustion facilities. In 2014, we disposed of more than 38 million tons of food waste. By managing food sustainably and reducing waste, we can help businesses and consumers save money, provide a bridge in our communities for those who do not have enough to eat, and conserve resources for future generations.

The Smart Digest Dustbin is design to help people to clean leftover easily. With the help of humidity and hardness sensor it will automatically clean the leftover and turn to be fertilizer.This system will inspire, engage and support people to take their personal responsibility of taking care the environment and making it fun and sustainable. This projects will be implementing using Arduino, Ic L293D and C programming

ABSTRAK

Kebanyakan orang tidak menyedari betapa banyak makanan yang mereka buang setiap hari, dari sisa makanan yang tidak dimakan untuk hasil manja. Kira-kira 95 peratus daripada makanan yang kita hancurkan berakhir di tapak pelupusan sampah atau kemudahan pembakaran. Pada 2014, kami melupuskan lebih daripada 38 juta tan sisa makanan. Dengan menguruskan makanan secara mampan dan mengurangkan sisa, kita boleh membantu perniagaan dan pengguna menjimatkan wang, menyediakan jambatan di komuniti kita untuk mereka yang tidak cukup makan, dan memelihara sumber daya untuk generasi akan datang.

Smart Digest Dustbin adalah reka bentuk untuk membantu orang membersihkan sisa dengan mudah. Dengan bantuan sensor secara automatik akan membersihkan sisa dan menjadi baja. Sistem ini akan memberi inspirasi, melibatkan dan menyokong orang untuk mengambil tanggungjawab peribadi mereka untuk menjaga alam sekitar dan menjadikannya menyeronokkan dan mampan. Projek-projek ini akan dilaksanakan menggunakan pengaturcaraan Arduino,IcL293D dan pengatucaraan C

ACKNOWLEDGEMENT

First and foremost we would like to take this opportunity to express our gratitude to everyone who support we throughout the course of this project. We would like to say gratitude to our supportive supervisor, Pn. Nurhafizah Binti Zakaria for her aspiring guidance, invaluably constructive criticismand friendly advice during the project work. A sincerely grateful to her for sharing her truthfuland illuminating views on a number of issues related to the project.

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CONTENT

Chapter 1

1.1 Introduction

A robot can be defined as a programmable, self-controlled device consisting of electronic, electrical or mechanical units. It is a machine that functions in place of living people. Robot are especially desirable for certain place because, unlike humans, the robot will never get tired.

The Smart Digest Dustbin can work in physical conditions that are uncomfortable or even dangerous. It can also never be distracted from the task at hand. This project can led to a low cost manufacturing organic fertilizers products as once the robot is implemented it can work repeatedly without any cost. This project will introduce a new era in the home to use automated machine and robot for more precise, cost effective and reliable work.

1.2 Objective

- To design a robot that can recycle the leftover
- To design a robot to process/digest the leftover to fertilizers
- To design a robot to that can make fertilizers in short time

This four objective is want to recycle the leftover to become a fertilizer.Next,we also want to reduce the pollution of the environment.Nowsday to many food has been wasted and we want to used this robot to recycle the leftover.

1.3 Problem Statement

Problem statement can be describe as an issues that need to be addressed by problem solving and should be presented before we try to solve any problem.

- That over 100 000 tonnes of food wasted everyday all over the world
- The food waste and plastic are not disposed of properly
- One of factor presence of pollution and not environmental friendly

1.4 Project Scope

Project scope is the part of project planning that involves determining and documenting a list of specific project goals, features, functions, tasks, and ultimately cost. It is what needs to be achieved and work that must be done to deliver a project.

- Our project only can be used to grind the leftover
- Cannot be used to grind the hard object such as a wood and plastic waste
- The motor only can be rotate not more than 3 minutes in single process this is because to maintain the durability of the blades

CHAPTER 2

LITERATURE REVIEW

2.1 Background of Project

There is a lot of different dustbin on the market, but they all have some sort of deficiency lack in certain points. Nowadays, our earth is getting dirty and this will cause environment pollution the main reason of environment pollution. So I create this smart digest dustbin is want to help our world become more clean, with this smart digest dustbin we can recycle the leftover so people do not throw the food everywhere and reduce the pollution .This project can improve more better in the near future. I hope this will help our cleaning staff.

2.2 List Of Components

In this topic, we will explain further about the components we used to develop the project

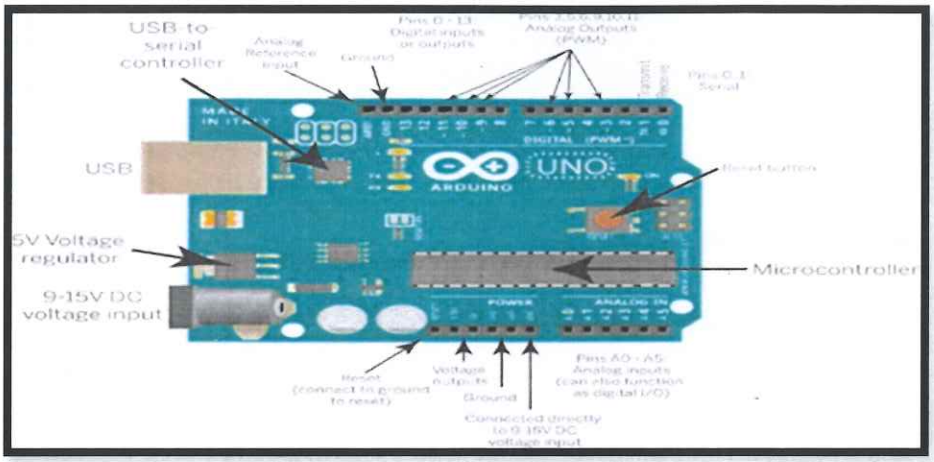

Figure 2.2.1 : Arduino Uno

Arduino is an open source computer hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, or as do-it-yourself kits.

Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment (IDE) based on the Processing language project.

The Arduino project started in 2003 as a program for students at the Interaction Design Institute Ivrea in Ivrea, Italy, aiming to provide a low-cost and easy way for novices and professionals to create devices that interact with their environment using sensors and actuators. Common examples of such devices intended for beginner hobbyists include simple robots, thermostats, and motion detectors.

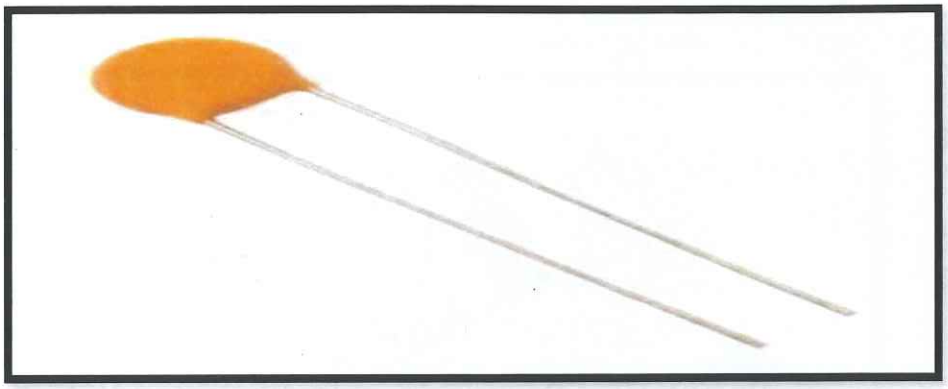

Figure 2.2.2 : Ceramic Capacitor

A ceramic capacitor is a fixed-value capacitor in which ceramic material acts as the dielectric. It is constructed of two or more alternating layers of ceramic and a metal layer acting as the electrodes. The composition of the ceramic material defines the electrical behavior and therefore applications.

Ceramic capacitors are divided into two application classes. Class 1 ceramic capacitors offer high stability and low losses for resonant circuit applications. Next, Class 2 ceramic capacitors offer high volumetric efficiency for buffer, by-pass, and coupling applications.

Ceramic capacitors, especially multilayer ceramic capacitors (MLCCs), are the most produced and used capacitors in electronic equipment that incorporate approximately one trillion (1012) pieces per year

Ceramic capacitors of special shapes and styles are used as capacitors for RFI/EMI suppression, as feed-through capacitors and in larger dimensions as power capacitors for transmitters

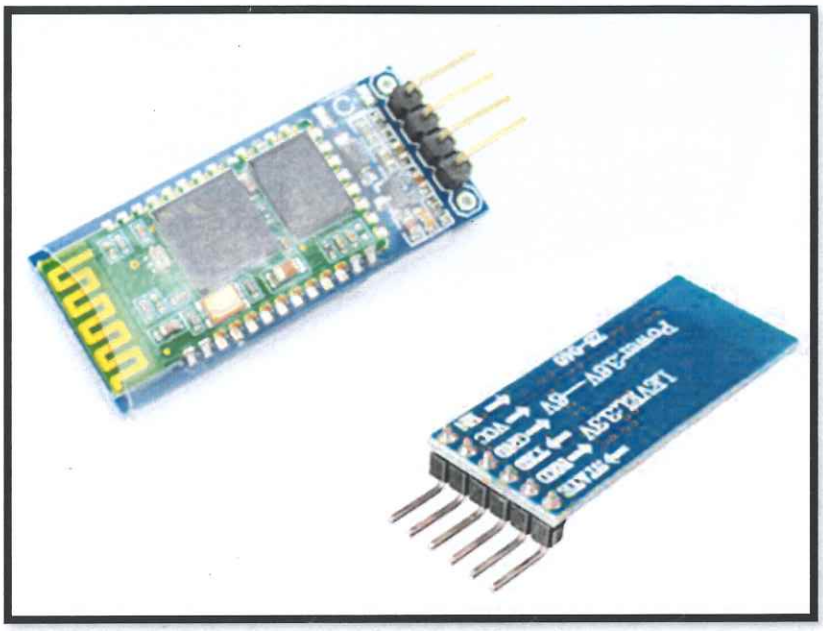

Figure 2.2.3 : Bluetooth

HC 05 works on serial communication. The Android app is designed to send serial data to the Arduino Bluetooth module when a button is pressed on the app. The Arduino Bluetooth module at other end receives the data and sends it to the Arduino through the TX pin of the Bluetooth module(connected to RX pin of Arduino). The code uploaded to the Arduino checks the received data and compares it. If the received data is 1, the LED turns ON. The LED turns OFF when the received data is 0. You can open the serial monitor and watch the received data while connecting.

Figure 2.2.4 : 12 volt battery

A rechargeable battery is a type of electrical battery which can be charged, discharged into a load, and recharged many times. It is composed of one or more electrochemical cells. The term "accumulator" is used as it accumulates and stores energy through a reversible electrochemical reaction. Rechargeable batteries are produced in many different shapes and sizes, ranging from button cells to megawatt systems connected to stabilize an electrical distribution network.

An automotive battery is a rechargeable battery that supplies electrical energy to a motor vehicle. It is also known as an SLI battery (starting-lighting-ignition) and its main purpose is to start the engine. Once the engine is running, power for the car's electrical systems is supplied by the alternator. Typically, starting discharges less than three per cent of the battery capacity. SLI batteries are designed to release a high burst of current and then be quickly recharged. They are not designed for deep discharge, and a full discharge can reduce the battery's lifespan.

As well as starting the engine an SLI battery supplies the extra power necessary when the vehicle's electrical requirements exceed the supply from the charging system. It is also a stabilizer, evening out potentially damaging voltage spikes. While the engine is running, most of the power is provided by the alternator, which includes a voltage regulator to keep the output between 13.5 and 14.5 V. Modern SLI batteries are lead-acid type, using six series-connected cells to provide a nominal 12 volt system (in most passenger vehicles and light trucks), or twelve cells for a 24 volt system in heavy trucks or earth-moving equipment, for example.

Battery electric vehicles are powered by a high-voltage electric vehicle battery, but they usually have an automotive battery as well, so that they can use standard automotive accessories which are designed to run on 12 V.

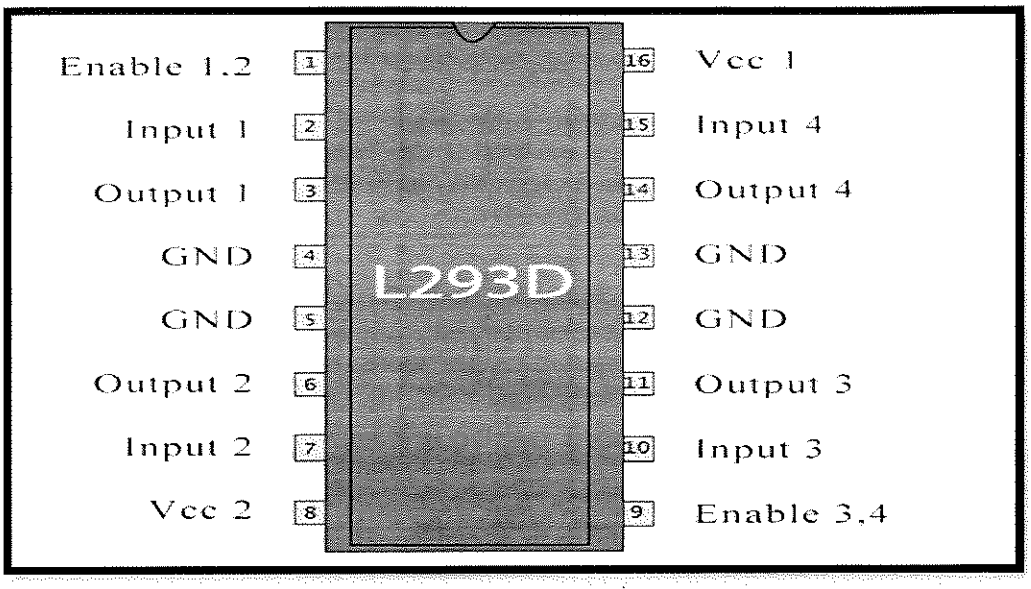

Figure 2.2.5 IC L293D

L293D is a dual H-bridge motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors

L293D contains two inbuilt H-bridge driver circuits. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse direction. The motor operations of two motors can be controlled by input logic at pins 2 & 7 and 10 & 15. Input logic 00 or 11 will stop the corresponding motor. Logic 01 and 10 will rotate it in clockwise and anticlockwise directions, respectively.

Enable pins 1 and 9 (corresponding to the two motors) must be high for motors to start operating. When an enable input is high, the associated driver gets enabled. As a result, the outputs become active and work in phase with their inputs. Similarly, when the enable input is low, that driver is disabled, and their outputs are off and in the high-impedance state.

Figure 2.2.6 : DC Motor

When the motor leads are connected to a source of DC power, the shaft spins. Small motors run best at a preferred voltage, which is listed on the data sheet. Common preferred voltages are 3, 6, 12 and 24 Volts. If a voltage much lower than the preferred is applied, the motor may not be able to overcome its internal friction. If a voltage much larger is applied, the motor may heat up.

Motors have torque-speed curves. For a fixed input voltage from a battery, the motor speed slows down as it is loaded. With no load on the shaft (free-running), the motor runs at the no-load speed (NLS), the fastest possible speed for that voltage. When the shaft is fully loaded and not allowed to move, the speed is zero and the motor is producing its stall torque (ST), the maximum possible torque. At stall torque, the current drawn out of battery is at its maximum, as is motor heating.

Motors should be operated at stall only for brief periods of time (seconds) to save on batteries and to keep the motor from melting.

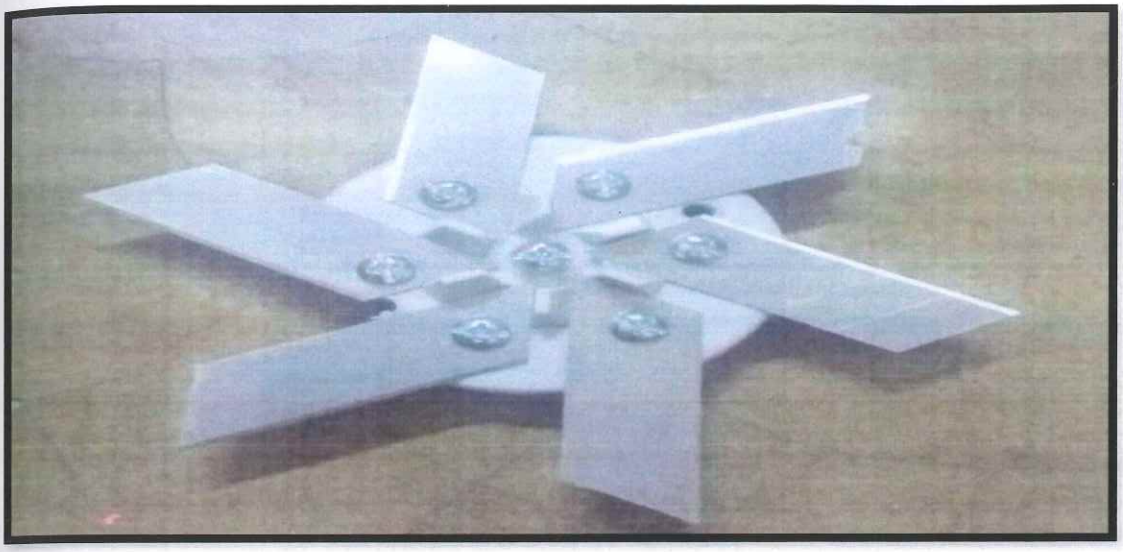

Figure 2.2.7 : Blade

Blade is the portion of a tool, or machine with an edge that is designed to puncture, chop, slice or scrape surfaces or materials. A blade may be made from a flaking stone, such as flint, metal (usually steel), ceramic, or other material. Blades are one of humanity's oldest tools, and continue to be used for combat, food preparation, and other purposes

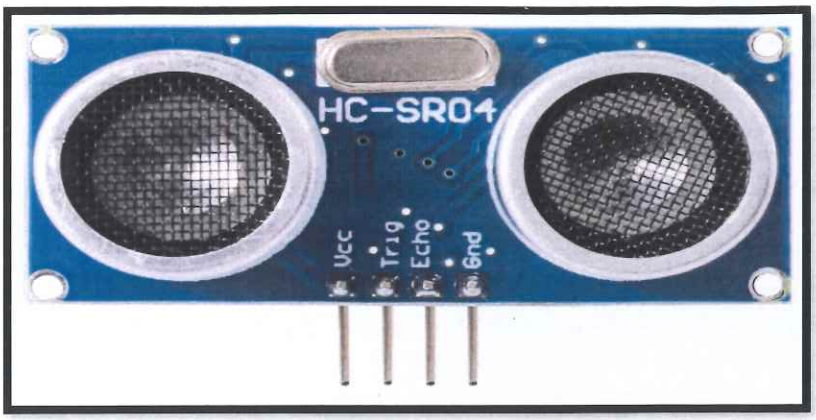

Figure 2.2.8 : Ultrasonic Sensor

An Ultrasonic sensor is a device that can measure the distance to an object by using sound waves. It measures distance by sending out a sound wave at a specific frequency and listening for that sound wave to bounce back. By recording the elapsed time between the sound wave being generated and the sound wave bouncing back, it is possible to calculate the distance between the sonar sensor and the object.

Ultrasonic transducers are divided into three broad categories: transmitters, receivers and transceivers. Transmitters convert electrical signals into ultrasound, receivers convert ultrasound into electrical signals, and transceivers can both transmit and receive ultrasound.

In a similar way to radar and sonar, ultrasonic transducers are used in systems which evaluate targets by interpreting the reflected signals. For example, by measuring the time between sending a signal and receiving an echo the distance of an object can be calculated. Passive ultrasonic sensors are basically microphones that detect ultrasonic noise that is present under certain conditions.