POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

SMART MOSQUE COINBOX WITH IOT SYSTEM

NAME: NUR AFRINA NATASHA BINTI APIZA

REGISTRATION NO: 08DJK20F1008

JABATAN KEJURUTERAAN ELEKTRIK

SESSION 1 2022/2023

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

JABATAN KEJURUTERAAN ELEKTRIK

SESSION: 1 2022/2023

CONFIRMATION OF THE PROJECT

The project report titled "Smart Mosque Coinbox with IOT System has been submitted, reviewed, and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

Checked by:

Supervisor's name :

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 : **NUR AFRINA NATASHA BINTI APIZA**

Registration Number : **08DJK20F1008**

Date :6/ 12/2022

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : SMART MOSQUE COINBOX WITH IOT SYSTEM

SESSION: 1 2022/2023

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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) **NUR AFRINA NATASHA BINTI APIZA** (Identification card No: - 08DJK20F1008)) .....
) **NUR AFRINA NATASHA BINTI APIZA**

In front of me, Click here to enter text. (Click here to enter text.)) .....
) Click here to enter text.
As a project supervisor, on the date:

ACKNOWLEDGEMENTS

First, I am grateful to ALLAH S.W.T for blessing me in finishing my final report project. Secondly, I want to thank my family for giving morale support and encouragement in completing my final proposal project. they are my inspiration to success. I also would like to thank my supervisor Encik Mahmud bin Selamat for guiding and supervising my project this semester. He has been very helpful to me in finishing my project and I appreciate every advice that he gave me in correcting my mistakes. I apologize to my supervisor for any mistakes and things that I done wrong while doing my project. Finally, I want to thank all my friends that have given me advice and encouragement in completing my project. Thank you very much to all and may ALLAH bless you.

ABSTRACT

A fund is an item to store and collect money. The fund is widely used by all surau and mosques for the public to give alms. In recent times, thefts and break-ins of mosque tubes are frequent. So, I've designed an electronic tube that has an iot system. This Smart Coinbox with Alarm Electronic Project aims to encourage people to be more diligent in giving alms. The fund has a liquid crystal display screen, to show the time and word the advantages of giving alms. During praying time, the buzzer will sound to attract people to donate. In addition, in this mosque coinbox has a moving mechanism to closes of coin hole and emergency alarm sound if any thieves to take out the coin. This fund also uses the IoT system, that is, it will provide notification when the fund is full or there is a theft problem.

ABSTRAK

Tabung adalah item untuk menyimpan dan mengumpul wang. Tabung ini digunakan secara meluas oleh semua surau dan masjid untuk orang ramai bersedekah. Sejak kebelakangan ini, kecurian dan pecah masuk tabung masjid adalah kerap. Jadi, saya telah merancang tabung elektronik yang memiliki sistem iot. Smart Coinbox dengan Projek Elektronik Penggera ini bertujuan untuk menggalakkan orang ramai untuk lebih rajin dalam memberi sedekah. Tabung ini mempunyai skrin paparan kristal cecair, untuk menunjukkan masa dan perkataan kelebihan memberi sedekah. Semasa waktu solat, buzzer akan berbunyi untuk menarik orang ramai untuk menderma. Di samping itu, dalam kotak duit syiling masjid ini mempunyai mekanisme bergerak untuk menutup lubang duit syiling dan bunyi penggera kecemasan jika ada pencuri untuk mengeluarkan duit syiling. Tabung ini juga menggunakan sistem IoT, iaitu, ia akan memberikan pemberitahuan apabila dana penuh atau terdapat masalah kecurian.

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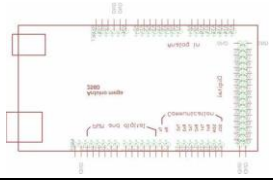
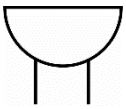
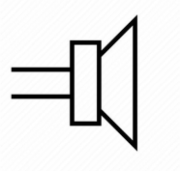
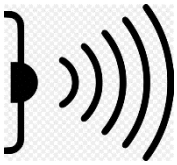
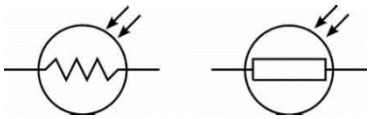
Arduino Mega	
Buzzer	
Speaker	
Infrared Sensor	
Ldr Sensor	
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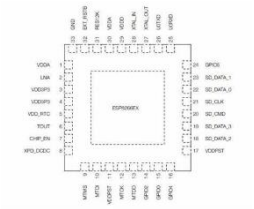
ESP8266	
Servo	

CHAPTER 1

INTRODUCTION

1.1 Introduction

A fund is an item to store and collect money. The fund is widely used by all surau and mosques for the public to give alms. In recent times, there has been a problem of theft of mosque funds. This problem often occurs because the security system is not tight and causes the problem of breaking the mosque coinbox. From that problem I took the initiative to design a smart mosque coinbox with iot system that has a strict security system. This Smart Coinbox with Alarm Electronic Project aims to encourage people to be more diligent in giving alms. The fund has a led, to show the time. Enough time, the buzzer will sound to attract people to donate. In addition, in this mosque coinbox has a moving mechanism to prevent theft. This fund also uses the IoT system, that is, it will provide notification when the fund is full or there is a theft problem. The main goal of this project was to use a microcontroller to automatically control a smart mosque coinbox.

1.2 Background Research

With the rapid advancement of the IoT market, companies tend to focus on time to market and release products as quickly as possible instead of developing secure products. This leaves many IoT products with insufficient protection against various forms of malicious attacks. IoT security is a growing problem and although there is a large amount of research on the topic, there is not much significant work on implementation or standardization that can solve this problem. The security of IoT is very important because the wrong effects in IoT can be harmful. The theft of surau fund which is prevalent can be avoided. Although undetectable theft is not exploited but still exists, it gives product owners a false sense of security that is ethically unacceptable. Because of the inconsistency of IoT products, the architecture, and

technologies they use it is impossible to develop consistent security measures that cover the entire spectrum of different devices. Therefore, IoT products should be developed according to security standards and not the other way around. For this research, I want to develop a smart mosque coinbox with iot for every mosque. The smart mosque coinbox with iot will be our case in this research and will represent a typical IoT device in our society.

1.3 Problem Statement

In recent times, there has been a problem of theft of mosque funds. This problem often occurs because the security system is not tight and causes the problem of breaking the mosque tube. Besides that, members of the surau committee were unable to deal with the widespread problem of theft of mosque boxes of coins. Besides that, the existing funds are less attractive to people to donate. Lastly, When the coinbox mosque is full, the surau members cannot detect the coinbox mosque is full or not.

1.4 Research Objectives

The main objective of this project is to control the problem of theft and mosque funds that often occur as well as to tighten the security of the existing funds

More specifically the principal objective of this research is:

1. To design Smart Mosque coin boxes can attract people to give alms when zikir, and selawat are recited.
2. To implement When the mosque coinbox is almost full, the surau committee will receive a notification through the iot system.
3. To develop Smart Mosque coinbox has an alarm that will sound when there is a theft problem, and the surau committee will get a notification via iot system.

1.5 Scope of Research

1. This project is focusing to develop Smart Mosque coinbox has an alarm that will sound when there is a theft problem, and the surau committee will get a notification via iot system.
2. The emphasis is on the problem of theft which often occurs on mosque funds
3. The main controller is using an Arduino that has been set on the coding to control moving mechanism to closes of coin hole and emergency alarm sound if any thieves to take out the money.

1.6 Project Significance

Currently, the existing fund in the surau or mosque is very simple, so there is no strict security. This existing tube is often the problem of theft such as the tube being stolen by a ruler. Therefore, I have created an idea to renew the old mosque fund, to a fund that has a strict security system. The fund I will design is called Smart Mosque Coinbox with iot. The fund has the following characteristics, the first is that this fund has a strict security system. For example, this tube has a barrier on the hole, it works so that when money is not inserted, the tube hole is closed, while when money is inserted, the tube hole will open. In addition, this mosque fund is also designed to make people who donate more interested, for example it has prayers to attract interest to give charity. In addition, the security of this tube will be stricter because it has a buzzer that works, when the tube is lifted from its place, the buzzer will sound and will notify the phone where the tube is stolen. Finally, this mosque fund will notify when the fund is almost full. This will make it easier for a person to not worry about always monitoring the mosque fund.

1.7 Chapter Summary

For this section which chapter 1, this is an introduction to my project. So, the introduction is related with my project which is smart mosque coinbox with iot system. The purpose for the project is to control the problem of the frequent theft meanwhile to entice the public to donate and make the shares of the afterlife.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Literature review is a study or review of a similar product that has been made. Literature review needs to be done so that I can understand about the project that I want too carefully. I've done a literature review and I've studied the product and the function of the product. After studying the product, I got a lot of knowledge, and I was able to improve my product.

2.2 Project of the money savings fund security

The beginning of this project, the purpose that I can see in this project is, we will create a security system for the mosque fund. We will use a method where when anyone wants to open the fund must enter the correct password to open the fund. When the password is entered correctly, the fund lock will open. So, the purpose that I can see for this literature review is a bit similar with my project which is smart mosque coinbox with iot system.

2.2.1 Previous Research

In recent times, the loss of mosque coffers often occurs. For everyone's knowledge, mosque coffers are always present in all mosques and suraus. There are some initiatives that I have made to attract people to be diligent in giving alms, for example the mosque fund that I will make this will have a howling sound to attract people to give alms. In addition to giving alms, they will be rewarded in the hereafter. In addition, these tubes have strict security. For example, the tube has a sensor that will sound when there is a theft and has a moving mechanism to prevent thieves from poking the tube.

(Innovation of mosque funds)

According to a previous study made by Annaz, 2014 from the article innovation of mosque funds, A fund for the mosque that can assist in the management of the business concerns of members or mosque users. This design focuses on the internal usage of the mosque and aims to give people with convenience in a way that is more methodical, safe, and user-friendly. The study also focuses on the working group and children of mosque villagers who always go to the mosque to fulfil religious orders and in addition enable them to make zakat payments and donations to an institution that needs donations. These individuals always go to the mosque to fulfil religious orders. This study was carried out to investigate the mosque fund system and application that has not been seen in certain mosques where we have visited. This fund is going to be renovated with a newer, more cutting-edge system and application, which will make it simpler for Muslims to participate in positive activities. The mosque fund that will be produced will be for a period of ten years and will come with system and application innovations that are more sophisticated and conceptual. One example of this type of innovation is the tubes ATM machine, which is designed to make it simpler for Muslims to donate money or carry out a donation act according to the purpose of the required donation.

(Towards Generating Effective Mosque Funds)

According to a previous study made by Husnul Rita Bt Aris and Nor Saadah Bt Musa, 2014 from the article mosque fund management towards community economy development, Bank Islam Malaysia Berhad (Bank Islam) recently started the Mosque Donation Fund programmer in the capital. This is to make sure that mobile funds in mosques all over the country are all the same. People say that this is a way to show appreciation for the cooperation between the mosque and the bank, which has made the mosque the bank's largest depositor. Through this programme, Bank Islam has given RM420,000 to issue 3000 fund units that will be given to selected mosques and suraus all over the country. Bank Islam hopes that a uniform mosque fund will encourage and make it easier for people to give money to mosques, whether they are inside or outside the mosque. Aside from that, the bank can put Cash Deposit

Machines, Check Deposit Machines, and ATM Money Withdrawal Machines in the mosque area. The bank can change the money/check slot on Cash Deposit Machines and Check Deposit Machines into two slots. The main slot is for putting money into the account the user wants, and the second slot is for giving money to the mosque account with a minimum of RM 1. The people who give money will get a receipt as a record. Indirectly, this will lead more people to give to the mosque fund. One of the most important parts of the mosque institution's fund is the mosque fund. It hasn't been able to do its job as well as it could because, so far, a mosque's only source of income has been keeping the money it collects in a bank and hoping to make money through savings that don't give back much. So, the different ways that mosque funds can be used can bring in multiple profits at once, which can help the local economy grow. But it needs the help of everyone, like the bank, the local community, the leaders, and the people who run the mosque itself. To make sure that mosque funds are managed smoothly, mosque committee members should learn more about how to run a mosque. This will help them do a better job of managing mosque funds. Members of the mosque committee should work together and talk to people in the area so that all ideas can be brought together and used for the common good. We hope that the mosque fund will be used in the best way possible to make as much money as possible, which will help the local economy grow. By doing this, we indirectly helped the government lower the number of poor people in the area.

(Money Savings Fund Security System Project)

According to a previous study made by Muhammad Zarif, 2019 from the article, money savings fund security system project, As part of this do-it-yourself project, we are going to construct a safety system for the mosque's endowment. We are going to adopt a system in which everyone who wants to open the fund will be required to provide the right password before the money can be opened. The door to the tube will unlock itself after the right password has been entered. If you wish to re-lock the tube, simply close it once again and then click either the * or # button. This will cause the tube lid to become locked. In addition, this undertaking has an extra safety mechanism, which consists of a buzzer that will activate if the tube is opened without first inputting the correct password. Not only that, but the safety lock will also be engaged to make certain that the money cannot be removed in any manner. The switch is located on the

top of the tube's lid to ensure that the tube remains locked even when the lid is opened. A signal will be sent from the switch to the Arduino, which will cause the buzzer and the safety lock to become operational. The tube's base is where the safety lock is installed for maximum visibility.

(Mosque fund)

According to a previous study made by Wan Fadhli Bin Wan Ismail, 2009 from the article, mosque fund project, a wheel, which is rarely seen in other mosques, is used to collect donations for the mosque's fund. If there were a wheel attached to the underside of this mosque fund shelf, it would make it much easier for this mosque fund to be moved from one location to another. In addition, shelf Islamic does not have to relocate and look for mosque fund since shelf Islamic can relocate mosque fund to raise funds. This is since it was previously impossible to move a crowd of Muslims who were coming to worship at the mosque on Fridays since they appear to be continuously going there. Put wheel in mosque fund is one example of creative thinking that might help lessen the burden on Islamic shelves which wished to contribute some alms.

(ANTI THEFT SAFEBOX)

According to a previous study made Siti Aisyah, Muhammad Aliff Aiman, Muhammad Dzarif Fiqri, 2020 from the article Anti-Theft Safe box, The fund that we want to make is to prevent cases of mosque fund theft and to create a tool that can contribute to the community and increase practice for supplies in this world and the hereafter. In addition, we created this mosque fund to make it easier for mosque Committee Members to get information about cases theft. Next, the mosque coffers we made also serve to scare thieves to steal money from the mosque coffers when they hear the alarm. This tube also has an alarm system, equipped with Arduino and Global System for Communication (GSM). Among the benefits or benefits of this fund to the community is that it makes it easier for Mosque Committee Members (AJK) to monitor the fund mosque especially at night. In addition, it can also reduce the risk of money theft in the mosque coffers. In addition, it also makes it easier for the community to separate paper money and coins when donating and makes it easier for mosque

committee members to count donations. There are several methods of use, among which is to make sure you put money in the place provided. In addition, it is forbidden to try to open the door of the box because the alarm will sound. In addition, separate coins, and paper money. To open the fund, the responsible member must send a message/signal to the fund. When a message or signal is sent, the alarm on the fund will go off and the fund door will be opened without producing an alarm sound. In conclusion, this product can cancel the intention of thieves to steal the mosque fund and alert the Mosque Committee Members that there is a change in the state of the mosque fund especially when their absence in the mosque. In addition, proposed proactive actions must be taken by the Mosque Committee members themselves to prevent cases of theft from occurring.

2.3 Control System (Literature Review Topic 2)

Nowadays the security system of the mosque fund is very weak. This project consists of a strict mosque fund security system. it was developed on a great solution to improve the security system of the mosque fund in every mosque and surau. Arduino IDE software in this I use a Wi-Fi device to control the mosque tube in the mosque and surau. An ESP8266 microcontroller is connected to the relay module control the security of the mosque fund. In this method, all data is controlled by the Blynk application in the application, I also provide manually that the tube hole of the mosque can be opened manually by using the blynk application.

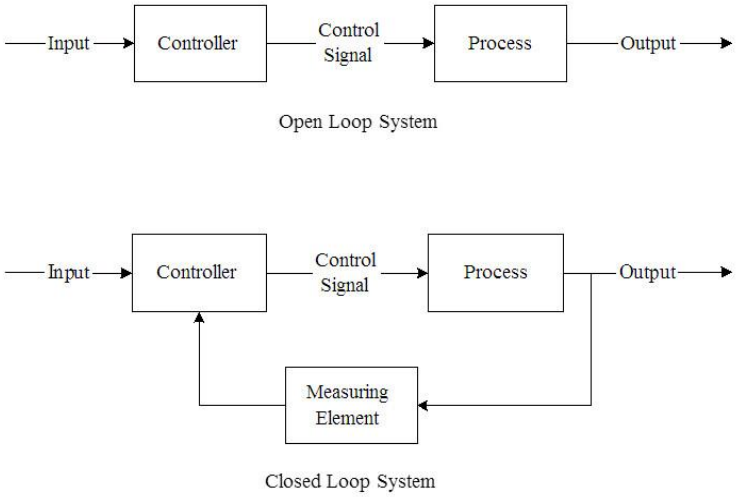


Figure 2. 1: Block diagram of open loop and closed loop system

2.3.1 Microcontroller

An embedded system's microcontroller is a small integrated circuit that controls a single process. On a single chip, a typical microcontroller has a CPU, memory, and input/output (I/O) peripherals. Microcontrollers, also known as embedded controllers or microcontroller units (MCU), may be found in a variety of devices, including vending machines, robotics, office equipment, medical devices, and office machines. They are essentially straightforward mini-personal computers (PCs) without a complicated front-end operating system that are used to operate minor aspects of bigger components (OS). To control a single device function, a microcontroller is integrated into a system. It accomplishes this by utilizing its core CPU to evaluate data that it receives from its I/O peripherals. The microcontroller receives temporary data that is stored in its data memory, where the processor accesses it and employs programmed memory instructions to interpret and apply the incoming data. It then communicates and takes the necessary action via its I/O peripherals. Numerous gadgets and systems make use of microcontrollers. Devices frequently employ several microcontrollers, which cooperate to carry out the device's many functions.

2.3.2 Programmable Logic Control (PLC)

An industrial digital computer that has been ruggedized and adapted for the control of manufacturing processes, such as assembly lines, machines, robotic devices, or any activity that requires high reliability, ease of programming, and process fault diagnosis is known as a programmable logic controller (PLC), also known as a programmable controller. PLCs are used to communicate, monitor, and manage automated tasks such as production lines, machine operations, or robotic devices. The inputs, outputs, and CPU are the three basic categories into which a PLC's functions fall. By keeping an eye on the inputs that machines and other devices are linked to, PLCs collect data from the factory floor.

2.3.3 Arduino

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards can read inputs - light on a sensor, activating a motor, turning on an LED, publishing something online. The Arduino Integrated Development Environment – or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them.

2.3.4 ESP8266

ESP8266 is Wi-Fi enabled system on chip (SoC) module developed by Expressive system. It is mostly used for development of IoT (Internet of Things) embedded applications. ESP8266 comes with capabilities of

- 2.4 GHz Wi-Fi (802.11 b/g/n, supporting WPA/WPA2),
- general-purpose input/output (16 GPIO),
- Inter-Integrated Circuit (I^2C) serial communication protocol,
- analog-to-digital conversion (10-bit ADC)
- Serial Peripheral Interface (SPI) serial communication protocol,
- I^2S (Inter-IC Sound) interfaces with DMA (Direct Memory Access) (sharing pins with GPIO),
- UART (on dedicated pins, plus a transmit-only UART can be enabled on GPIO2), and
- pulse-width modulation (PWM).

2.4 Chapter Summary

This section focusing on two different sections, the first is find a sensor that will have use in project. There are three main components that will be used in this project which is Arduino UNO, sensors, and microcontroller. The second section is discovered about the technical part, including the selection of the type of controller. In this project I would use Arduino and for the sensor I use Infrared sensor to detect coin.

CHAPTER 3

RESEARCH METHODOLOGY

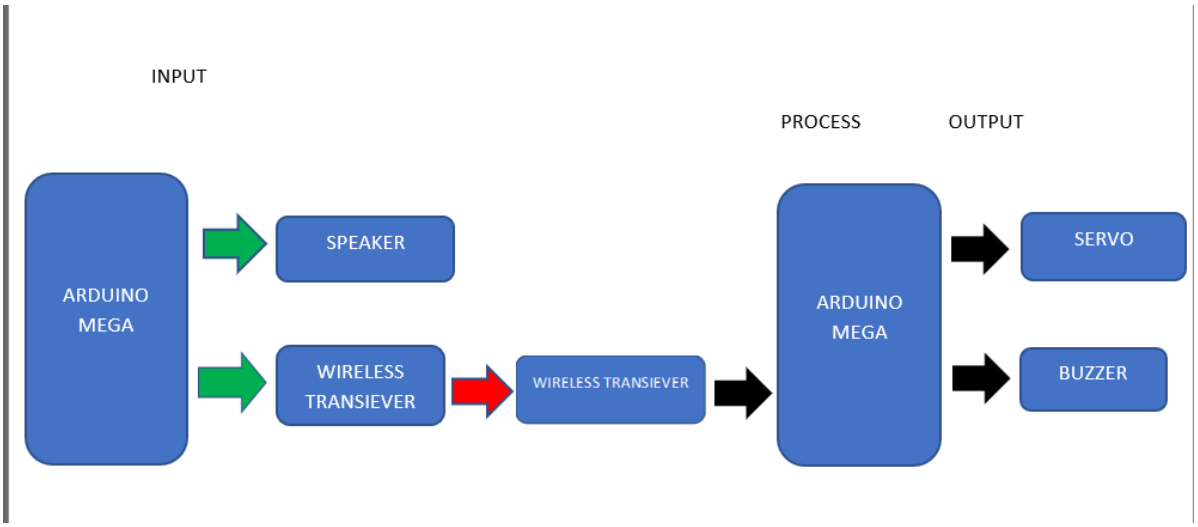
3.1 Introduction

Research methodology is a method and technique of designing, collecting, and analyzing data to produce evidence that can support a study. Methodology describes how a problem is studied and why certain methods and techniques are used. The purpose of the methodology is to help understand more broadly about the application of methods by making a description of the research process. According to the Fourth Edition Hall Dictionary methodology means a system that includes methods and principles used in an activity or discipline. Other meanings of methodology are method, path, technique, style, manner, rhythm, pattern, and system. Methodology also means knowledge of the methods or disciplines used when conducting a particular study to achieve a particular purpose. Research methodology refers to the most appropriate method to conduct research and determine effective procedures to answer research problems.

3.2 Project Design and Overview.

As mentioned in the previous chapter, the designed controller is using a closed-loop system with Arduino and ESP8266 as the main controller. The design of the controller circuit using Arduino realizes using Proteus Software and then convert to PCB circuit. It consists of the relay, servo, WI-FI, buzzer, speaker, infrared sensor, Ldr sensor and servo. For my project overview, this mosque tube hole. Then inside the tube in the middle, have a moving mechanism to cover the tube. Inside the tube there is a sensor that is on the side of the tube.

3.2.1 Block Diagram of the Project



3.2.2 Flowchart of the Project 2

Figure 3. 1 shows the circuit diagram of the whole system. It is shows the process of the smart mosque coinbox with iot functioning. at first, the mosque coinbox should connect to internet. After that, people must be downloading a blynks apps to connect with the tube. After the surau committee have the apps, they can find out that the tube is in good condition rather than using a mobile phone only. If the plug is on there have sound of the selawat and the tube hole is close. If to put a money the tube hole has opened. After that, if when the tube is almost full it will notify through the blynk application. In addition, if the tube is lifted from its place, it will sound a buzzer in addition to being notified via email and from the blynk application

Flowchart of the project

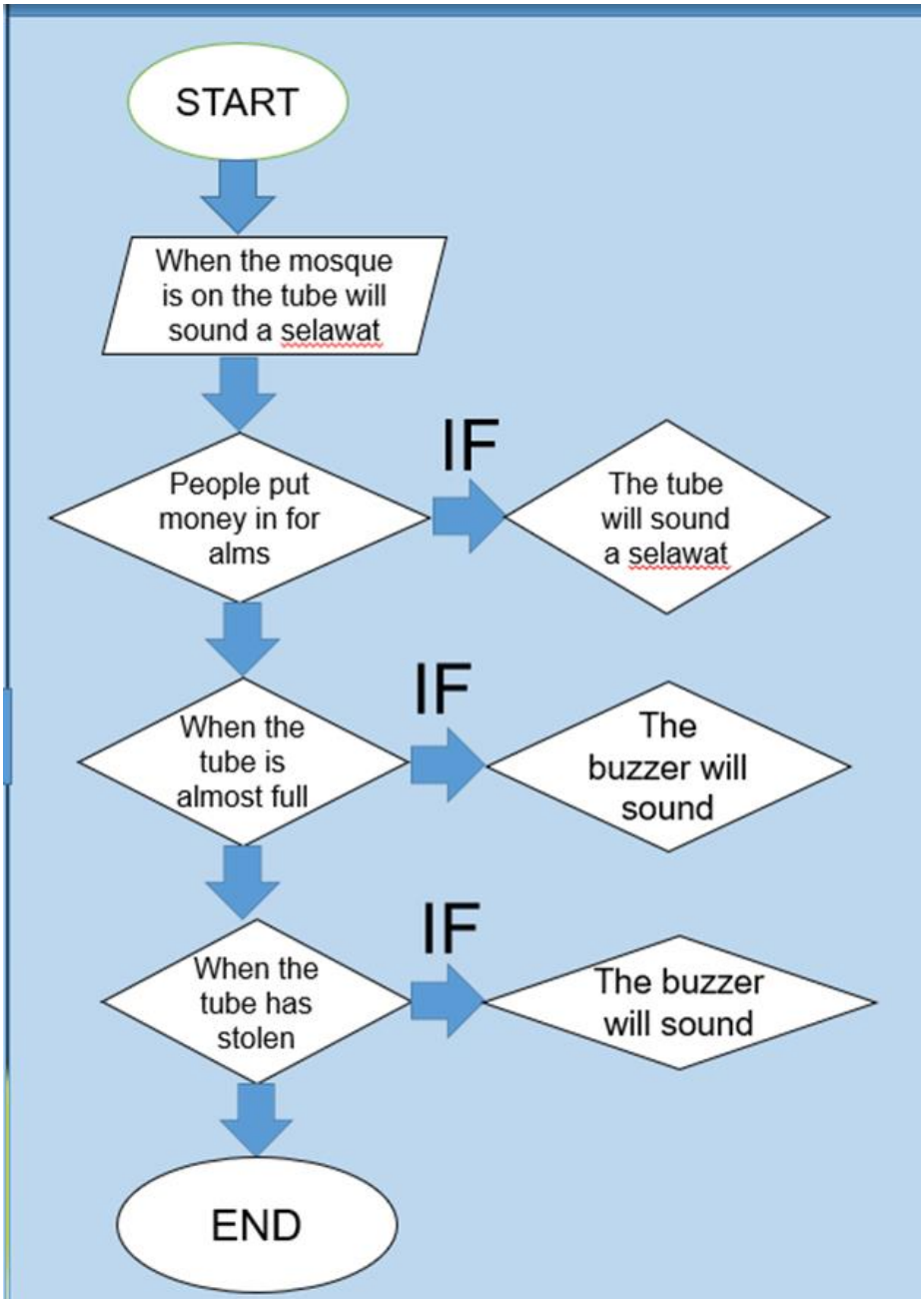


Figure 3. 1: Flow chart of operation of the system

3.2.3 Project Description

The purpose of this project is to develop a more stringent security system that can only be monitored using an application on a smartphone. This innovation is a sensor for safety. A notification will be received on the smartphone when the tube is stolen. The mobile app will then display a status of either stolen or not stolen. This function can be monitored in the application.

3.3 Project Hardware

As mentioned in the previous chapter, the designed controller is using Arduino UNO. The lcd is used to display date and time. The sensor is used to sound when having a theft problem and inside this tube has a moving mechanism that will move to close the hole when the thief pokes the hole of the tube. The last one, this fund has an IoT system to notify the members of the surau committee when the surau fund is full.

3.3.1 Schematic Circuit

Figure 3.2 shows the overall circuit diagram of this project Which is smart mosque coinbox with iot system.

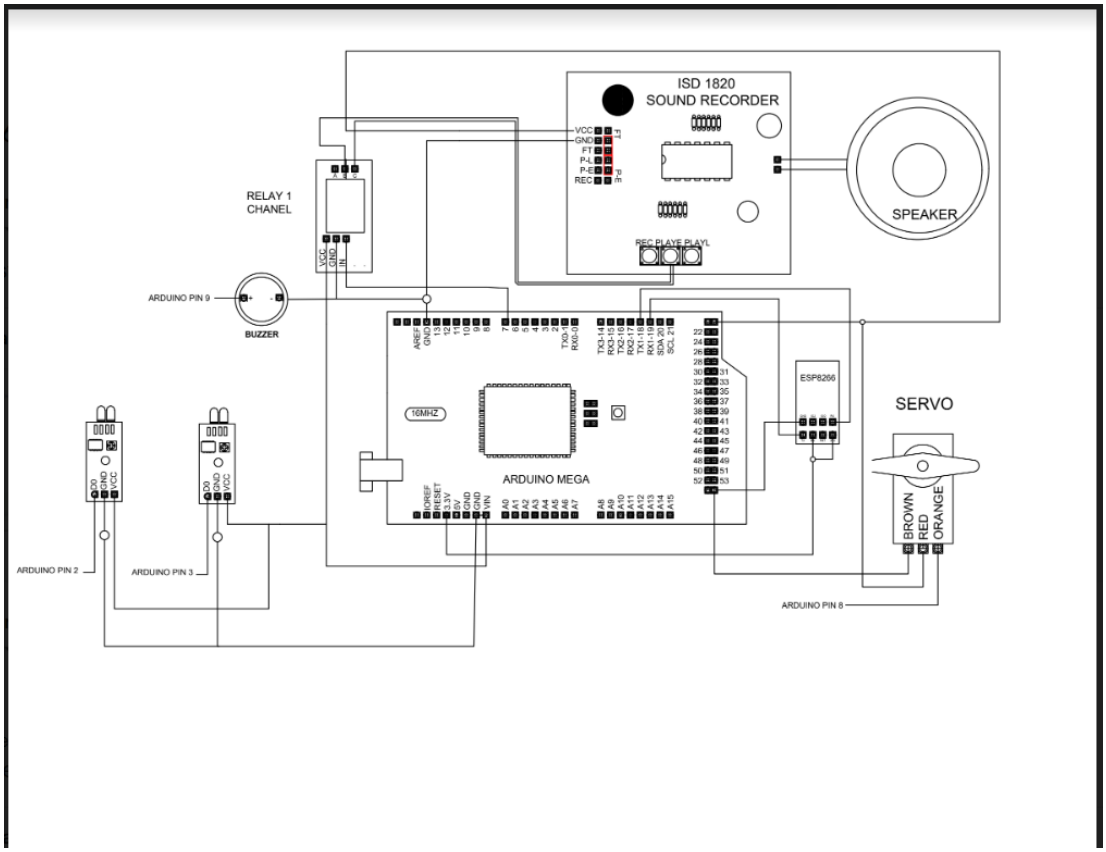


Figure 3.2: Circuit Diagram of mosque coinbox

3.3.2 Description of Main Component

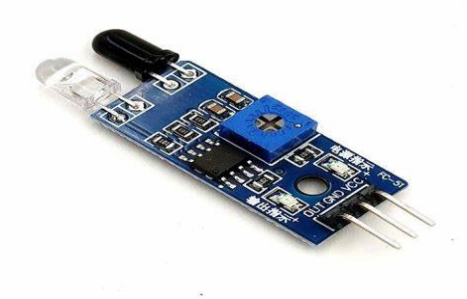
3.3.2.1 Arduino UNO

The Arduino UNO is categorized as a microcontroller that uses the ATmega328 as a controller in it. The Arduino UNO board is used for an electronics project and mostly preferred by the beginners. The Arduino UNO board I type of Arduino board only. The Arduino board is the most used board of all Arduino boards. The board contains 14 digital input/ output pins in which 6 are analog input pin, one power jack, USB connector, one reset button, ICSP header, and other components. All these components are attached in the Arduino UNO board to make it function and can be used in the project. The board is charged by USB port or can be directly charged by the DC supply to the board.

3.3.2.2 Servo

Servo motors are part of a closed-loop system and are comprised of several parts namely a control circuit, servo motor, shaft, potentiometer, drive gears, amplifier and either an encoder or resolver. A servo motor is a self-contained electrical device, that rotate parts of a machine with high efficiency and with great precision. The output shaft of this motor can be moved to a particular angle, position, and velocity that a regular motor does not have. The Servo Motor utilizes a regular motor and couples it with a sensor for positional feedback. The controller is the most important part of the Servo Motor designed and used specifically for this purpose. The servo motor is a closed-loop mechanism that incorporates positional feedback to control the rotational or linear speed and position.

3.3.2.3 Infrared sensor

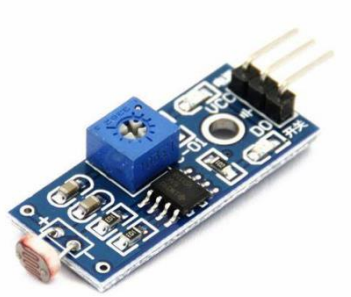


Infrared Sensor is most used sensor in wireless technology where remote controlling functions and detection of surrounding objects/ obstacles are involved. IR sensor is a simple electronic device which emits and detects IR radiation to find out certain objects/obstacles in its range. Some of its features are heat and motion sensing. IR sensors use infrared radiation of wavelength between 0.75 to 1000μm which falls between visible and microwave regions of electromagnetic spectrum. IR region is not visible to human eyes. Infrared spectrum is categorized into three regions based on its wavelength i.e., Near Infrared, Mid Infrared, Far Infrared.

3.3.2.4 BUZZER

Buzzer is an audio signaling device like a beeper or buzzer may be electromechanical or piezoelectric or mechanical type. The main function of this is to convert the signal from audio to sound. Generally, it is powered through DC voltage and used in timers, alarm devices, printers, alarms, computers, etc. Based on the various designs, it can generate different sounds like alarm, music, bell & siren.

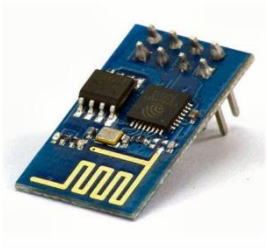
3.3.2.5 Ldr sensor



An LDR sensor (Light Dependent Resistor) is a device that is used to detect light. It has a (variable) resistance that changes with the light intensity that falls upon it. This allows them to be used in light sensing circuits. They are used in many consumer products to determine the intensity of light. An LDR or light dependent resistor is also known as a photoresistor, photocell, photoconductor. It is one type of resistor whose resistance varies depending on the amount of light falling on its surface. When the light falls on the resistor, the resistance changes. To sense the presence of light these

resistors are often used. These resistors have many functions and resistances. For instance, when the LDR is in darkness, then it can be used to turn ON the light or to turn OFF the light when it is in the light.

3.3.2.6 ESP8266



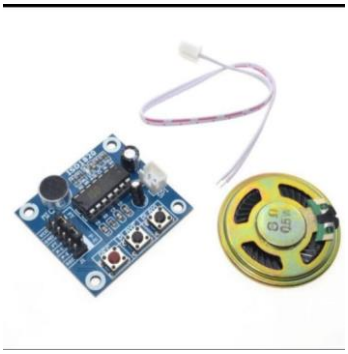
ESP8266 is Wi-Fi enabled system on chip (SoC) module developed by Expressive system. It is mostly used for development of IoT (Internet of Things) embedded applications. ESP8266 comes with capabilities of

- 2.4 GHz Wi-Fi (802.11 b/g/n, supporting WPA/WPA2),
- general-purpose input/output (16 GPIO),
- Inter-Integrated Circuit (I^2C) serial communication protocol,
- analog-to-digital conversion (10-bit ADC)
- Serial Peripheral Interface (SPI) serial communication protocol,
- I^2S (Inter-IC Sound) interfaces with DMA (Direct Memory Access) (sharing pins with GPIO),
- UART (on dedicated pins, plus a transmit-only UART can be enabled on GPIO2), and
- pulse-width modulation (PWM).

3.3.2.7 Adapter plug

This wall mounted switching adapter 12V 1.5A uses primary-side regulation (PSR) to achieve precise voltage and current regulation without using an optocoupler at a secondary site, thus, to minimize the cost and optimize energy efficiency performance. The 12V 1.5-amp AC adapter provides a high-power-density and cost-effective solution for a variety of application field. The 12-volt switching adapter operates at a high switching frequency with a low total standby consumption and low output ripple and noise. The dive switching adapter 12V is equipped with full protection functions to improve the reliability including OCP, OVP, OLP. Effective thermal management enhances reliability further, allows the 12V 1.5A power adapter to operate at full power in higher ambient temperatures.

3.3.2.8 ISD 1820 VOICE RECORDING MODULE



Voice Recorder and Playback Module for Arduino ISD1820. Depending on what's going on, there are times when you need to play a certain recorded voice message. For example, if someone gets into a car accident, a sensor that detects a strong hit will play a pre-recorded voice message repeatedly. ISD1820 Voice Recorder and Playback Module can also be used in projects that have to do with security. When an intruder is found, a message is played repeatedly. The ISD1820 module can be used in offices that need to play different voice messages, like when someone opens the door. A welcome message is only played once. If it's break time, you can record a new message that will play if someone opens the door. Depending on what's going on, you can record different messages.

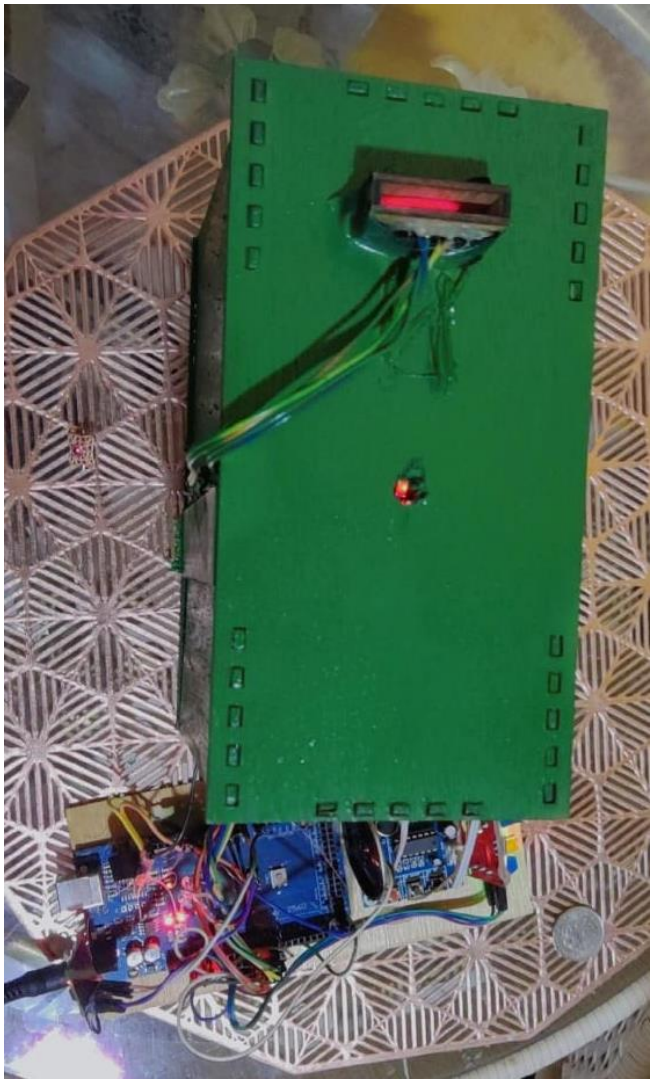
3.3.3 Circuit Operation

For the circuit operation, which is smart mosque coinbox with IOT, When I turn on the tube, the tube will issue prayers. The tube hole is closed and when a coin is inserted the hole will open in a few seconds to drop the coin. In addition, when the fund is almost full, the fund will give an iot notification to the surau ajk. Finally, when the tube is anchored from the original place, the tube will make a sound from the buzzer, in addition to the surau ajk will get a notification from the phone

3.4 Project Software

The software that I have used to design a schematic diagram is proteus. There are a few components only in the proteus. By using a proteus it will be easier for me to design a circuit. Besides that, I used blynk it so that it becomes easier because it only needs to be monitored by phone.

3.5 Prototype Development



3.6 Chapter Summary

In chapter 3 that I have made is that I list the components used in my project. In addition, I know the functions of the components that I use so that I can have knowledge about the functions of my project. When I know the function of each component, it makes it easier for me to do my project. Also, I can learn about my project system when I create a flowchart.

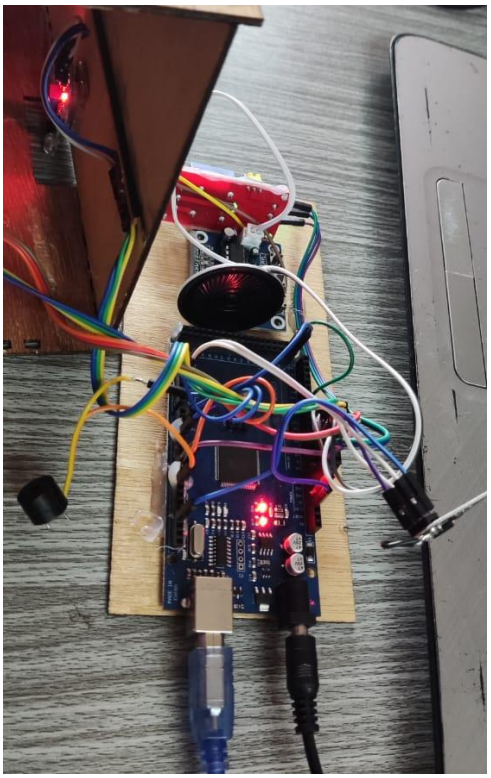
CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

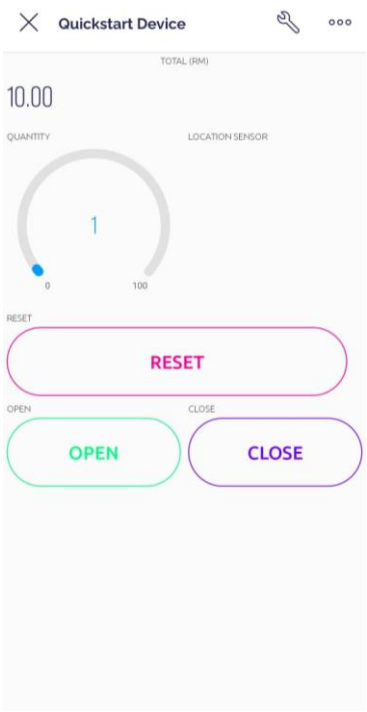
I successfully implemented a smart mosque coin box with iot, on-board logic unit like ESP8266 and user-friendly mobile application. All the features suggested in the beginning, I implemented and tested, including some additional features. I ensure that requests and user information are secure.

4.2 Results and Analysis



DATA	RESULT
Times period to open and close the hole tube manually using an application on a smartphone	OPEN=3 seconds CLOSE=3 seconds
Times period to receive a notification when the tube is stolen	Less than 5 seconds
Range of WI-FI connection between the tube and ESP8266	10 meters
Control the tube using the Blynk application	All devices (android and ios)

When the tube is connected to an application on a smartphone, the mosque tube can be monitored using the application, blynk. The Wi-Fi connection range between the app and the ESP8266 is 5 meters. A manual button is made for the manhole to open and close manually. Servo is used to open and close the mosque tube. The hole in the ark is opened when the ldr sensor detects money while the hole in the ark will be closed after the money falls into the hole. When the ruler tries to insert the tube hole will not open. When the mosque tube is lifted from its original place, the buzzer will be activated, and a notification will be given in the blynk application and email. When the mosque fund is almost full, it will notify through the blynk application.



4.3 Discussion

The advantage of using this blynk application is that it makes it easier for surau committee members to monitor the state of the mosque fund and ensure that the mosque fund is always in good condition even if they are far from the mosque or surau area. The use of this blynk application can detect this tube in a safe condition. One of the ways to use this blynk application is that the first step of the mosque fund must be connected to the internet so that this blynk application can be used. When the tube is connected to the internet then it can function as when the tube is lifted or tried to be taken away the buzzer will sound, while the system will send a notification to the application that the tube has been stolen. In addition, this application can notify you that the bank is almost full. The last function, I open and close the tube hole manually for preventive measures when the tube hole does not work.

4.4 Chapter Summary

At the end of chapter 4 i do is I can find out the advantages of using the blynk application and know the functions used for my project. In addition, I can find out the function of the mosque fund when I activate the mosque fund that has been designed.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes the work done in this report and there some suggestion future for my project.

5.2 Conclusion

In conclusion, this project was accepted by the public. Even though at the beginning of the project there were some problems such as difficult use and lack of value, the project could eventually be improved and generally accepted. Such a project will take a long time to meet the set criteria. With the cooperation and guidance provided by the project supervisor, this project can be completed successfully. After various studies and experiments that have been done on this project, I can prove that the use of mosque funds has successfully helped the mosque and surau reduce the problem of theft and has a positive impact on the public as a whole, my project has met the criteria or objectives of the project because it can make it easier and can help mosque people in monitoring the mosque fund at a long distance. The system used is well received because it is easy to operate. Comparison with other methods further reinforces the usefulness of this project.

5.3 Suggestion for Future Work

With this project on the market, I believe that the demand for better security in the market can be met. Therefore, I believe and hope that this project will continue to be expanded. Accordingly, I hope that the creation of this innovation can attract more interest and anyone who wants to create or improve tools to help anyone. This innovation can not only meet our needs but also lighten the burden. With this, it will not only help the community but also encourage young people to continue to think creatively. Maybe new ideas can give this innovation greater and cannot be widely used only to the door but also to other things. The improvement that I want to add to my mosque fund project is that I want to add gps so that I can track the location of this fund when stolen.

5.4 Chapter Summary

For the conclusion that I can make in chapter 5 is that I made some suggestions for improvements to the mosque fund that I have made with the suggested improvements that can make the security of the mosque fund guaranteed and there will be no more problems of theft of money from the mosque fund that occurs. The goal of this project is to provide a simple method and to prevent the theft of mosque funds. I begin by assessing the need for such a system by analyzing the results

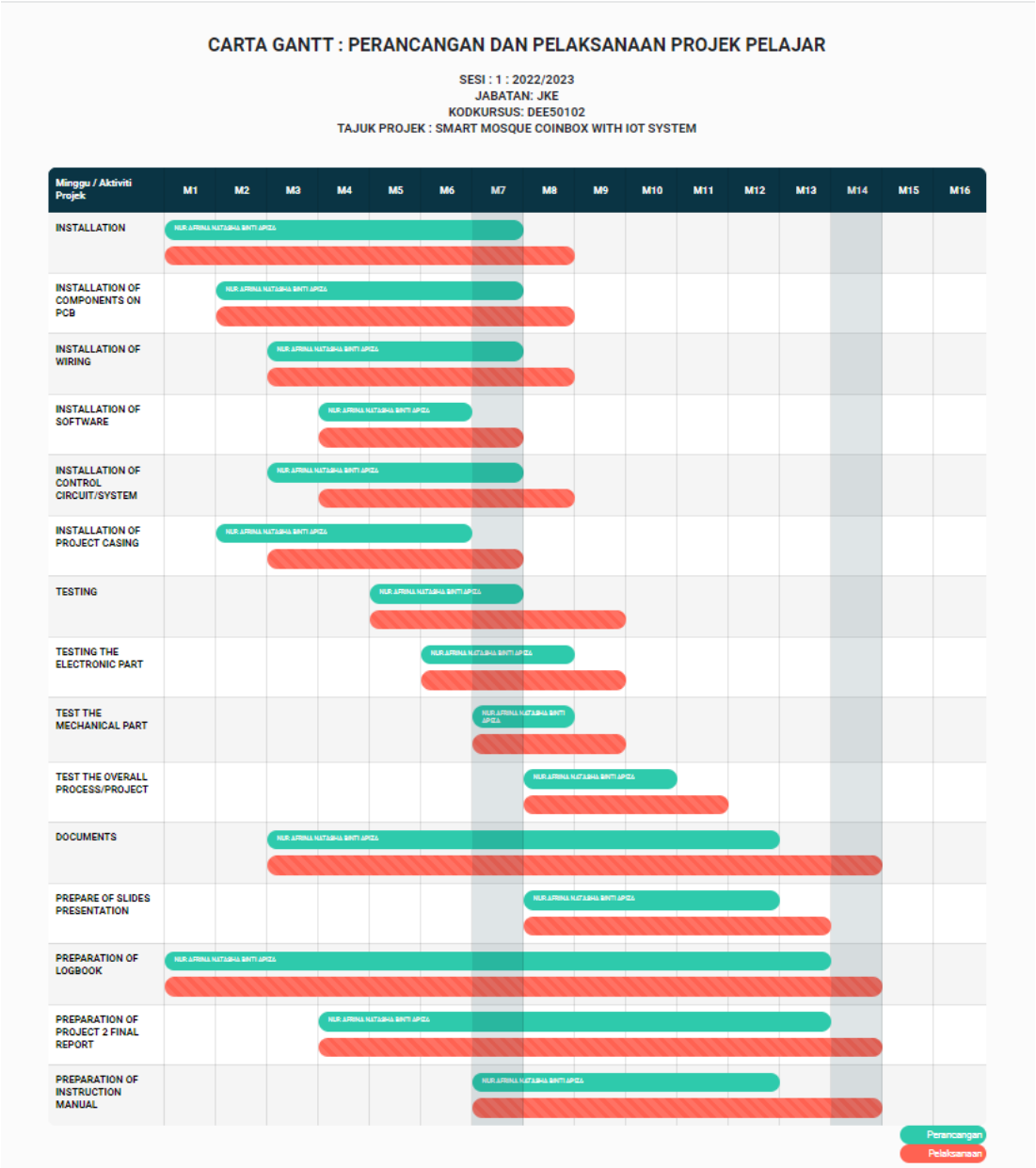
CHAPTER 6

PROJECT MANAGEMENT AND COSTING

6.1 Introduction

This project involves the cost of purchasing components and materials throughout its implementation. Components that involve cost are Arduino mega, buzzer, speaker, infrared sensor, ldr sensor, jumper, ESP8266 adapter and ISD 1820 voice recording module. These components are purchased through the online purchase method for convenience and cost savings. The overall gross budget estimate in the implementation of this project is RM204.50 and other expenses are postage costs of RM18 as shown in 6.3 according to the cost of this budget, this project can be considered as a project that costs less than other projects that can cost more than a thousand ringgit. The cost of the project is also in line with one of the main characteristics of a good project developer which is low cost but has a high-quality project. Project activities are shown in the form of a Gantt Chart in 6.2 from week one to week 14.

6.2 Gant Chart and Activities of the Project



6.3 Cost and Budgeting

No.	Component and materials	The unit price	Quantity	Total
1	Arduino Mega 2560 + usb cable	RM78.00	1	RM78.00
2	ESP8266 wifi module	RM20.00	1	RM20.00
3	Buzzer	RM3.50	1	RM3.50
4	ISD1820 Voice Recording Module	RM20.00	1	RM20.00
5	LDR sensor	RM10.00	1	RM10.00
6	Infrared Sensor	RM10.00	1	RM10.00
7	Adapter 12v 1A	RM15.00	1	RM23.98
8	Other materials			RM54.20
	Total:			**RM219.68**
	List of other costing			
1	Transportation			RM16
2	Postage			RM24
3	Craft Work			
4	Internet			RM40
5	Application			
	Total:			**RM80.00**
			Overall total	**RM 299.68**

6.4 Chapter Summary

For the conclusion I can make in chapter 6 is that I made a Gantt chart throughout doing my project for 14 weeks so that the project is carried out every week systematically. My function is to create a Gant chart so that I can divide the time easily. In addition to this chapter, I list the costs that I used throughout my project as an example of the cost of each component, shipping cost, my transportation cost and the last is the cost of the internet throughout my project. The estimated cost that I have used for my project which is smart mosque coinbox with iot is Rm 299.68. The cost I use is not too much and not too little.

REFERENCES

[1] Solutions, N. E. (2019, August 6). *Projek Sistem Keselamatan Tabung Simpanan Duit - Nadi Eleczone Solutions*. https://www.nadieleczone.com/tutorial-arduino/projek-tabung-masjid/

[2] Aniq, A. (n.d.). PROPOSAL PROJECT. *Www.academia.edu*. Retrieved from https://www.academia.edu/33846488/PROPOSAL_PROJECT

[3] INOVASI TABUNG MASJID. (n.d.). Retrieved December 13, 2022, from https://annaz5914.blogspot.com/

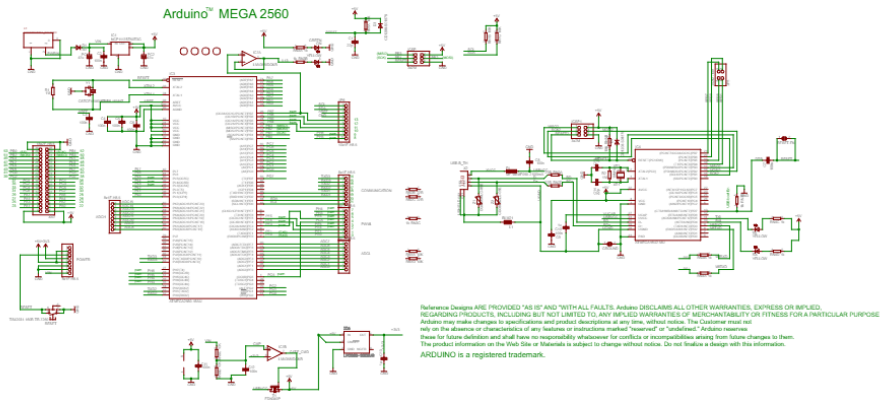
[4] Tabung Masjid. (n.d.). Retrieved December 13, 2022, from https://076115tabung2.blogspot.com/

[5] Kamarul, M., Bin, A., Sarkam, M., Bin, R., Bin, Y., Ghani, A., … Pertahanan, P. (2014). *PENGURUSAN DANA TABUNG MASJID DI MALAYSIA: SATU KAJIAN DI MASJID AL-MUTTAQIN WANGSA MELAWATI, KUALA LUMPUR BAGI TAHUN 2012-2013*. Retrieved from http://conference.kuis.edu.my/i-maf/images/eproceedings/2014/masjid/m07-imaf-2014.pdf

APPENDICE

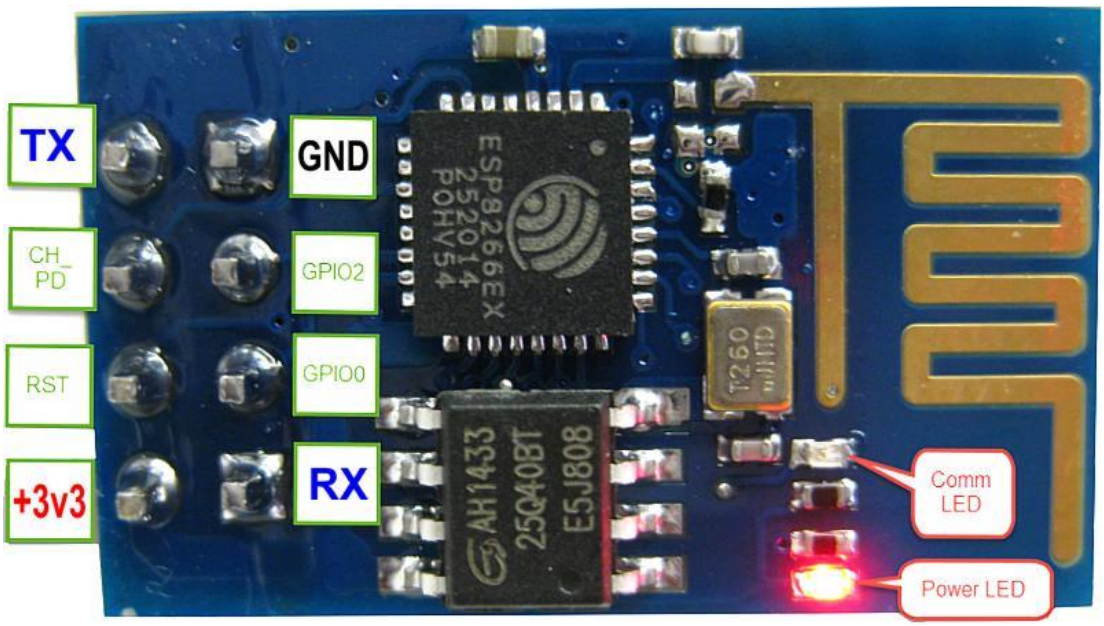
APPENDIX A- DATA SHEET

Data sheet Arduino Mega



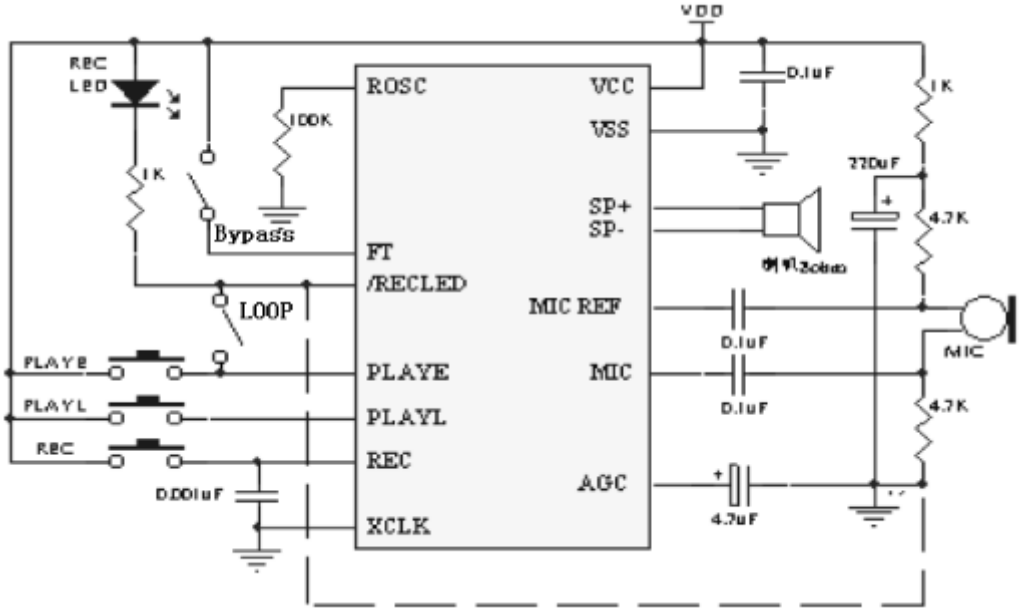
Microcontroller	ATmega2560
Operating Voltage	5V
Input Voltage (recommended)	7-9V
Input Voltage (limits)	6-20V
Digital I/O Pins	54 (of which 14 provide PWM output)
Analog Input Pins	16
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	256 KB (8 KB used by bootloader)
SRAM	8 KB
EEPROM	4 KB (ATmega328)
Clock Speed	16 MHz

Data sheet esp8266



- 802.11 b/g/n protocol
- Wi-Fi Direct (P2P), soft-AP
- Integrated TCP/IP protocol stack
- Integrated TR switch, balun, LNA, power amplifier and matching network
- Integrated PLL, regulators, and power management units
- +19.5dBm output power in 802.11b mode
- Integrated temperature sensor
- Supports antenna diversity
- Power down leakage current of < 10uA
- Integrated low power 32-bit CPU could be used as application processor
- SDIO 2.0, SPI, UART
- STBC, 1×1 MIMO, 2×1 MIMO
- A-MPDU & A-MSDU aggregation & 0.4μs guard interval
- Wake up and transmit packets in < 2ms
- Standby power consumption of < 1.0mW (DTIM3)

Data sheet ISD1820 Voice Recording Module



1.VCC–3.3V power supply

2.GND–Power Ground

3.REC–The RKM input is an active high record signal. The module starts recording when RKM is HIGH. This pin must remain HIGH for the duration of their recording. RKM takes precedence over the playback signal (PLAYL orlay).

4.PLAY–Playback, Edge-activated: When a HIGH-going transition is detected it is turned on continuously until the End of Message (EOM) marker at the end of the memory space is reached.

5.PLAYL–Playback, Level-enabled, when the level of this input pin goes from LOW to HIGH, the playback cycle is started.

6. Speaker Output–SP+ and SP- pins provide direct drive for loudspeakers with impedance as low as 8Ω.

7. Microphone Input MIC, the microphone input transfers its signal to the preamplifier on the chip.

8.FT–Feed Through: This mode allows the Microphone to drive the speakers directly.

9.P-E–Play the end record with less. Record Operations Guide

1. Press the RKM button, then the RKM LED will light up and keep pressing until the end of the record.

2. Release the RKM button

3.Select playback mode: PLAY, only need to push once, and will playback all records or power off; PLAYL, you need to keep pressing this button until you want to stop the playback record or end; When the P-E jumper is short, the record will play back one time until the jumper is dead or dead.

4.FTmode, when Ft jumper is short, it means you all talking with MIC will direct playback to Speaker. SP+SP- MIC.

APPENDIX B- PROGRAMMING

```
#include <Wire.h>
#include "MAX30105.h"
#include <Servo.h>
#include "heartRate.h"


MAX30105 particleSensor;
Servo myservo;
#define  IR 3
#define SOUND 7
#define Buzz 9
float TOTAL=0;
int QTY=0;
int Acount=0;
int Pcount=0;
int Mcount=0;
int IRSTAT=0;
String inputString = "";
int MODE=0;
float WET=0;
int LCDStat=1;
int MyAlu=0;
int MyPla=0;
int MyPpr=0;
const byte RATE_SIZE = 4; //Increase this for more averaging. 4 is good.
byte rates[RATE_SIZE]; //Array of heart rates
byte rateSpot = 0;
long lastBeat = 0; //Time at which the last beat occurred
int Tcount=0;
float beatsPerMinute,AvgRead,Glucose;
```

```
int beatAvg,i;
float AvgMax,AvgMaxR,AvgMin,AvgMinR,Reading;
int MODEE=0;
int MDD=0;
int ALM1=0;
int ALM2=0;
int Mode=0;
float LDR=0;
int Timerx=0;
int Alm=0;
float Strength=0;
int pos=0;
int pos1=0;
int RM10=0;
int RM1=0;
int RM5=0;
float LEVEL=0;
int Metal=0;
float Sens1,Metalx;
int TWIFI=0;
int PROCESS=0;
//--------------------------------------------
  long UpperThreshold = 518;
    long LowerThreshold = 490;
    long reading = 0;
    float BPM = 0.0;
    bool IgnoreReading = false;
    bool FirstPulseDetected = false;
    unsigned long FirstPulseTime = 0;
    unsigned long SecondPulseTime = 0;
    unsigned long PulseInterval = 0;
```

```
  int MyTimer=0;
//-----------------------------------------------


void setup()
{
pinMode(IR,INPUT);
   myservo.attach(8);


  Serial.begin(9600);
 Serial3.begin(9600);


 Serial.println("Initializing...");
 Serial.begin(9600);
pos=90;
pos1=90;
pinMode(Buzz,OUTPUT);
pinMode(SOUND,OUTPUT);
digitalWrite(SOUND,HIGH);
 delay(1000);
digitalWrite(Buzz,HIGH);
delay(50);
digitalWrite(Buzz,LOW);
delay(50);
digitalWrite(Buzz,HIGH);
delay(50);
digitalWrite(Buzz,LOW);
delay(50);
```

```
  // Initialize sensor
  if (!particleSensor.begin(Wire, I2C_SPEED_FAST)) //Use default I2C port, 400kHz speed
  {
    Serial.println("MAX30105 was not found. Please check wiring/power. ");
    while (1);
  }
  Serial.println("Place your item on the sensor with steady pressure.");
   particleSensor.setup(); //Configure sensor with default settings
  particleSensor.setPulseAmplitudeRed(0x0A); //Turn Red LED to low to indicate sensor is running
  particleSensor.setPulseAmplitudeGreen(0); //Turn off Green LED
}
void loop()
{
  if (digitalRead(IR)==0){
    IRSTAT=0;
     TWIFI++;
 if (TWIFI>50){
    Serial.println("UPDATE WIFI....");
    Serial3.print("*");
    Serial3.print(TOTAL);
    Serial3.print("*");
    Serial3.print(QTY);
    Serial3.print("*");
    Serial3.print(IRSTAT);
    Serial3.println("#");
    /*
    ss.print("*");
    ss.print(LEVEL);
    ss.println("#");
    */
```

```
TWIFI=0;
 }
  }
    if (digitalRead(IR)==1){
   IRSTAT=1;
   digitalWrite(Buzz,HIGH);
delay(50);
digitalWrite(Buzz,LOW);
delay(50);
digitalWrite(Buzz,HIGH);
delay(50);
digitalWrite(Buzz,LOW);
delay(50);

 TWIFI++;

 if (TWIFI>20){
   Serial.println("UPDATE WIFI....");
   Serial3.print("*");
   Serial3.print(TOTAL);
   Serial3.print("*");
   Serial3.print(QTY);
   Serial3.print("*");
   Serial3.print(IRSTAT);
   Serial3.println("#");
   /*
   ss.print("*");
   ss.print(LEVEL);
   ss.println("#");
   */
```

```
TWIFI=0;
 }

  }
// Sens1 = analogRead(A0);          //read the value from the sensor
 // Metalx= (5.0 * Sens1)/1024.0;  //convert the analog data to moisture level

 long irValue = particleSensor.getIR();

 //Serial.print("IR=");
  Reading=irValue/1000;
  long beatIR=map(irValue,60000,80000,0,100);
  if (beatIR<0){
    beatIR=0;
  }
 irValue = particleSensor.getIR();
  Serial.print(Reading);
  Serial.print("\t");
    Serial.print(IRSTAT);
  Serial.print("\t");
  Serial.print(TOTAL);
  Serial.print("\t");
  Serial.print(QTY);
  Serial.print("\t");
  //Serial.print(", BPM=");
  //Serial.print(beatsPerMinute);
  //Serial.print(", Avg BPM=");
  //Serial.print(beatAvg);
  //Serial.print(" Temperature:");
  //Serial.print(temperature,1);
 Tcount++;
```

```
if (irValue < 50000){
   Serial.print(" No Item?");
   if (LCDStat>0){
   }
 }
 //*************************************************

if (Reading>=3){
 LCDStat=1;

}

  //#####################################################
  Serial.println();

 if (Reading<15 && PROCESS==1){
   MyTimer++;
   if (MyTimer>=5){
     MyTimer=0;
     MyPla=0;
     MyAlu=0;
     MyPpr=0;
     RM10=0;
     RM1=0;
     RM5=0;
     PROCESS=0;
     Serial.println("START AGAIN..");
     CLOSEX();
   }

 }
```

```
//----------------------------------------
if (PROCESS==0){
    if (Reading>=45 && Reading<60){
   MyPpr++;
   if (MyPpr>=20){
    MyTimer=0;
    MyPla=0;
    MyAlu=0;
    MyTimer=0;
    RM10=0;
    RM1=1;
    RM5=0;
    PROCESS=1;
   }
   }

   if (Reading>=35 && Reading <=44){
   MyPla++;
   if (MyPla>=20){
    MyTimer=0;
    MyPpr=0;
    MyAlu=0;
    MyTimer=0;
    RM10=0;
    RM1=0;
    RM5=1;
   }

  }
```

```
if (Reading>=70 && Reading <=120){
   MyAlu++;
    if (MyAlu>=20){
     MyTimer=0;
     MyPpr=0;
     MyAlu=0;
     MyTimer=0;
     RM10=1;
     RM1=0;
     RM5=0;
   }
 }
 }
//--------------------------------------------------
if (RM1>0){
Serial.println("RM1 DETECTED!!!");
TOTAL=TOTAL+1;
QTY++;
digitalWrite(Buzz,HIGH);
delay(20);
digitalWrite(Buzz,LOW);
delay(20);
digitalWrite(Buzz,HIGH);
delay(20);
digitalWrite(Buzz,LOW);
delay(20);
OPENX();
SOUNX();
```

```
Reading=0;
irValue=0;
delay(2000);
RM1=0;
MyPpr=0;
 }
if (RM5>0){
TOTAL=TOTAL+5;
QTY++;
  Serial.println("RM5 DETECTED!!!");

  digitalWrite(Buzz,HIGH);
delay(20);
digitalWrite(Buzz,LOW);
delay(20);
digitalWrite(Buzz,HIGH);
delay(20);
digitalWrite(Buzz,LOW);
delay(20);
OPENX();
SOUNX();

Reading=0;
irValue=0;
delay(2000);
RM5=0;
MyPla=0;
```

```
}


//*********************************************


if (RM10>0){
TOTAL=TOTAL+10;
QTY++;
 Serial.println("RM10 DETECTED!!!");
  digitalWrite(Buzz,HIGH);
delay(20);
digitalWrite(Buzz,LOW);
delay(20);
digitalWrite(Buzz,HIGH);
delay(20);
digitalWrite(Buzz,LOW);
delay(20);
digitalWrite(Buzz,HIGH);
delay(20);
digitalWrite(Buzz,LOW);
delay(20);
OPENX();
SOUNX();
RM10=0;
```

```
delay(2000);
  Reading=0;
  MyPla=0;
     MyAlu=0;
     MyPpr=0;
     RM10=0;
     RM1=0;
     RM5=0;
irValue=0;
delay(2000);

}
//--------------------------------------------------------------------------

delay(50);

}



void ReadSensor(){

}
```

```
void InitSensor(){
  if (!particleSensor.begin(Wire, I2C_SPEED_FAST)) //Use default I2C port, 400kHz speed
  {
    Serial.println("MAX30105 was not found. Please check wiring/power. ");
    while (1);
  }
  Serial.println("Place your index finger on the sensor with steady pressure.");

  particleSensor.setup(); //Configure sensor with default settings
  particleSensor.setPulseAmplitudeRed(0x0A); //Turn Red LED to low to indicate sensor is running
  particleSensor.setPulseAmplitudeGreen(0); //Turn off Green LED
}

void serialEvent() {
  while (Serial.available()) {
    // get the new byte:
    char inChar = (char)Serial.read();
    // add it to the inputString:
    inputString += inChar;
    // if the incoming character is a newline, set a flag so the main loop can
    // do something about it:
    if (inChar == '!') {
digitalWrite(SOUND,LOW);
delay(1000);
digitalWrite(SOUND,HIGH);
delay(20);
```

```
}
    if (inChar == '@') {
     myservo.write(170);
   }
    if (inChar == '#') {
     myservo.write(0);
   }
    if (inChar == '%') {
    TOTAL=0;
    QTY=0;
   }
 }
}

void SOUNX(){
  digitalWrite(SOUND,LOW);
delay(1000);
digitalWrite(SOUND,HIGH);
delay(20);
}

void OPENX(){
 myservo.write(170);
}

void CLOSEX(){
  myservo.write(0);
}
```

APPENDIX C- PROJECT MANUAL/PRODUCT CATALOGUE