Final Report Project 2

by Noradibah Norhan

Submission date: 04-Jul-2022 02:36PM (UTC+0800)
Submission ID: 1866452752
File name: Final_Report_P2.pdf (1.05M)
Word count: 6164
Character count: 38907

POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

SMART HOME MAILBOX

NORADIBAH BINTI NORHAN

(08DEP19F2006)

JABATAN KEJURUTERAAN ELEKTRIK

NOVEMBER 2021

SMART HOME MAILBOX

NORADIBAH BINTI NORHAN

(08DEP19F2006)

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 “Smart Home Mailbox” has been submitted, reviewed and verified as a fulfills the conditions and requirements of the Project Writing as stipulated.

Check by :

Supervisor’s name :

Supervisor’s signature :

Date :

Verified by :

Project Coordinate 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 : NORADIBAH BINTI NORHAN

Registration Number : 08DEP19F2006

Date : 17/1/2022

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : SMART HOME MAILBOX

SESSION : SESI 1 2021/2022

1. I'm **NORADIBAH BINTI NORHAN (IC NO: 011217-11-0432)** 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.**

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) NORADIBAH BINTI NORHAN ……..
(Identification card No: 08DEP19F2006) NORADIBAH BINTI NORHAN

In front of me, PN. NUR HADIANA BINTI NASRUDDIN ……..

As a project supervisor, on the date : PN. NUR HADIANA BINTI NASRUDDIN

ACKNOWLEDGEMENTS

I have taken effort in this Project. However, it would not have been possible without the support and help of many individuals and supervisors. I would like to say a huge thank you to them all. I am very indebted to Pn. Nur Hadiana Binti Nasruddin for continuous guidance and supervision as well as providing the necessary information related to the Project & also for support in completing the Project.

I would like to record my thanks to my parents for their cooperation and encouragement that helped me in completing this Project. I would like to express my gratitude and thanks to the industry for giving me such attention and time.

My thanks and appreciation are also extended to my colleagues in developing the Project and those who are willing to help me with their abilities.

ABSTRACT

"Smart Home Mailbox" is a smart mailbox that we recommend. Users with a cellular phone and a conventional web browser can easily receive spam-filtered notifications for mail received. Several times a day, we check our virtual mailboxes. The goal of this project is to develop a smart mailbox. The primary goal of this research is to introduce smart mailbox applications by including sanitizer into mailboxes. The application's primary job is to detect the presence of packages in the mailbox. The application's hardware consists of a mailbox design and a number of related components that perform various smart operations. The smart mailbox's software guarantees that the hardware components work properly. This is characterised as a mailbox that can alert the recipient when mail has been delivered, provides access to the appropriate persons, and cleans itself automatically.

ABSTRAK

"Peti Mel Rumah Pintar" ialah peti mel pintar yang kami cadangkan. Pengguna dengan telefon selular dan pelayar web konvensional boleh menerima pemberitahuan ditapis spam untuk mel yang diterima dengan mudah. Beberapa kali sehari, kami menyemak peti mel maya kami. Matlamat projek ini adalah untuk membangunkan peti mel pintar. Matlamat utama penyelidikan ini adalah untuk memperkenalkan aplikasi peti mel pintar dengan memasukkan sanitizer ke dalam peti mel. Tugas utama aplikasi adalah untuk mengesan kehadiran pakej dalam peti mel. Perkakasan aplikasi terdiri daripada reka bentuk peti mel dan beberapa komponen berkaitan yang melaksanakan pelbagai operasi pintar. Perisian peti mel pintar menjamin bahawa komponen perkakasan berfungsi dengan baik. Ini dicirikan sebagai peti mel yang boleh memberi amaran kepada penerima apabila mel telah dihantar, menyediakan akses kepada orang yang sesuai dan membersihkan dirinya secara automatik.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Introduction

Smart mailboxes are a vital feature of the future home, as they keep track of all deliveries. Users can track delivered things in real time as a result of this. The goal of the project was to investigate and compare mail and data transfer detection technologies from mailbox to residence. Market research for availability technology, experimental data collecting, cost analysis, and solution comparison are the three steps of the research.

1.2 Background Research

It's easy to let lesser things fall by the wayside in today's world, given how busy people are. Many people struggle with simple tasks like opening their mailbox. An everyday task such as opening your mailbox is something many people can neglect due to forgetfulness. It is difficult, however, to miss a notification concerning. In your virtual mailbox, you'll find mail. Integrating the actual and virtual mailboxes prove useful, especially since many critical letters are sent in a specified format physical shape.

A linked home is a logical step toward the future as part of digitization and the internet of things (IOT). Including a smart mailbox in a smart home is a modest but significant step toward achieving this aim. This thesis intends to increase knowledge of various reading/scanning methods, particularly when applied to letters. There's also some advice on how to make routine tasks easier by making them "smart."

1.3 Problem Statement

The issue arises when you are away from home for an extended period of time. People are too preoccupied with their jobs to come home late or go on vacation. They sometimes forget to check the mailbox for goods. Aside from that, getting information on when an item has arrived is slow. When people are waiting for significant mail, they may frequently check their mailboxes. It's aggravating when they arrive from a high floor and see their belongings, but they aren't there yet or the mailbox is empty.

Finally, the item is vulnerable to theft. Consumers are frequently too preoccupied and gone from home for extended periods of time. The likelihood of subsequent theft is considerable, and the item may be quite valuable to the customer.

1.4 Research Objectives

More specifically the principle objective of this research are :

1. To design Smart Home Mailbox, secure mailing notifications and automate sanitize.
2. To implement the design of the model into Smart Home Mailbox.
3. To develop the mechanical aspects of the mailbox an iterative design process to used, constructing and testing solutions searching for improvements for a more optimal design.

1.5 Scope of Research

This Project is focusing on consumers who buy from online when there is a theft of items in the mailbox.

The emphasis is to companies, schools, flats/condominiums.

The main controller is using Arduino Uno.

1.6 Project Significance

The goal of this project is to develop a smart mailbox. The ability to alert the recipient that mail has been received is defined as “smart” in this sense. Second, with the presence of automatic sanitizers in the mailbox to prevent the spread of viruses that occur nowadays. The goal is to create a product that will show that the concept is variable and functional in the future, and the solution is made taking into account residential or office buildings.

1.7 Chapter Summary

In this first chapter, I discussed the background research for the original idea for the start of this project in this first chapter. Then I identified the issues that are currently occurring. I've also showed the project's objectives and deleted the scope of the study I acquired from the objective study. Besides that, the Smart Home Mailbox which comes together with the sanitizer inside the box, can be a very careful for users. Hence, we can conclude that the required goals and objectives of Smart Home Mailbox will be achieved. In the next chapter, the literature of the project will be presented.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Some researchers are needed to develop the existing system. This is to gather information and determine what the existing system can do as well as its flaws. From the flaws, improvements can be made to improve the project's effectiveness in solving the user's problem.

2.2 The Smart Mailbox

This is a mailbox that can both alert the recipient that mail has been delivered and provide access to the appropriate individual. The procedure for receiving notifications a barcode scanner scans incoming letters to do this and specifies the person who will get it. After that, an e-mail is sent to them. Announcing the arrival of a letter a research project on various. The study of barcodes has led to the conclusion that the most relevant code to utilise for this project was Code-128. The mailbox's scanning accuracy was checked, and it passed. It was discovered that a familiar user can accurately scan a letter in 90% of the time.

2.2.1 Authorization for access

Radio frequency identification (RFID) is a technology that allows tags and items to be identified wirelessly. The primary benefit of RFID is that the tags do not require a power supply. As a result, the implementation options are numerous. RFID uses three separate frequencies to operate. Low frequency, high frequency, and super high frequency are the three types. Varying reading ranges are possible due to the different frequencies. While lower frequencies can only be read from a few centimetres away, extremely high frequencies can be read from a distance of one metre. RFID is extremely exact, which is why it is frequently used in systems that require high accuracy and quick response times, such as access control systems or logistics and supply chains .

2.3 User Interface in Graphics

The web application pulls data from the database, which is then transformed into useful information. There is data on the current, maximum, and minimum humidity and temperature readings (Fig 2.3). The web programme also features a graphical representation of temperature and humidity over time.

The material on the web is automatically updated thanks to Ajax technology, which allows for changes to the website's content to be made without having to manually reload the page.

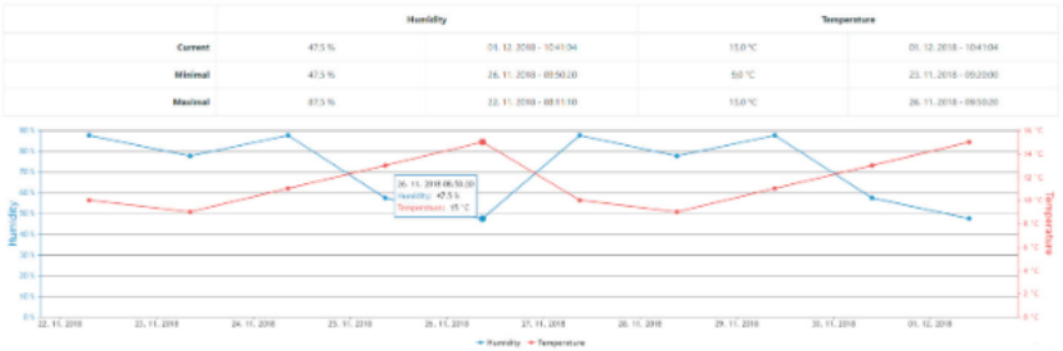


Figure 2.3: User Interface in Graphics

2.4 Smart Speaker Interface

Google Home, a smart speaker, is connected to the system. When a user says to Google Home, "OK Google, check physical mailbox," it responds with either "you have mail in your mailbox" or "your mailbox is empty," depending on the mailbox's condition. An If This Then That (IFTTT) applet is used to implement this customised query. Simple IFTTT applets can detect customised inquiries and respond with a static response, but they can't choose from a list of responses based on sensor data. To overcome this issue, the applet's action is changed to a web request using Webhooks. With the term voice in the URL, IFTTT sends an HTTP GET request to the hub's friendly name and port number.

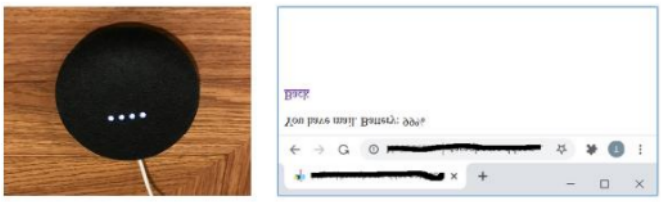


Figure 2.4: Smart Speaker Interface

2.5 System Architecture

The suggested method attempts to improve the security of one specific link in the logistics chain. When crucial documents and shipments are delivered, the courier will typically ask for a signature. However, in order to do so, the recipient must wait at home, which can be inconvenient at times. The prototype allows the user to securely receive a document or shipment regardless of whether he is at home or not. The courier can only leave the shipment in the Smart Mailbox when the user has remotely opened it, and the user can only receive the shipment at a convenient time if the system has cleared him as a legitimate user.

2.6 Application Wireless Sensor ESP8266 For Smart Home Automation.

The current data is read by an ACS712 sensor, and the voltage data is read by a ZMPT101B transformer sensor. The ADC ADS1115 converts the analogue data to digital, which is subsequently read by the ESP8266. DHT 22 reads temperature and humidity data, which is then transferred directly to the ESP8266. ESP8266 uses the MQTT (Message Queuing Telemetry Transport) protocol to send the read data to the web server. On the Raspberry Pi web server, data will be updated on a regular basis.

2.7 Chapter Summary

The research approach chosen for this project was experimental testing because it is centred on product innovation. When this product is ready to be built, it will be put to the test in order to see how effective it is at solving the problem. Furthermore, this literature review aids in the development of a theoretical framework consisting of research concepts and hypotheses whose success can be evaluated, as well as providing information for research relevance and coherence.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The procedures or strategies used to find, select, process, and analyse information about a topic are referred to as research methodology. The method is utilized to meet the project's goal, which is to contribute to a perfect outcome. This chapter will go over the detailed explanations that are being used to complete and test this project.

3.2 Project Design and Overview

Schematic capture in the Proteus Design Suite is used for both the simulation of designs and as the design phase of a PCB layout project. It is therefore a core component and is included with all product configurations. The PCB Layout module is automatically given connectivity information in the form of a netlist from the schematic capture module. It applies this information, together with the user specified design rules and various design automation tools, to assist with error free board design. PCB's of up to 16 copper layers can be produced with design size limited by product configuration.

3D Verification.

The 3D Viewer module allows the board under development to be viewed in 3D together with a semi-transparent height plane that represents the boards enclosure. STEP output can then be used to transfer to mechanical CAD software such as Solid works or Autodesk for accurate mounting and positioning of the board.

3.2.1 Block Diagram of the Project

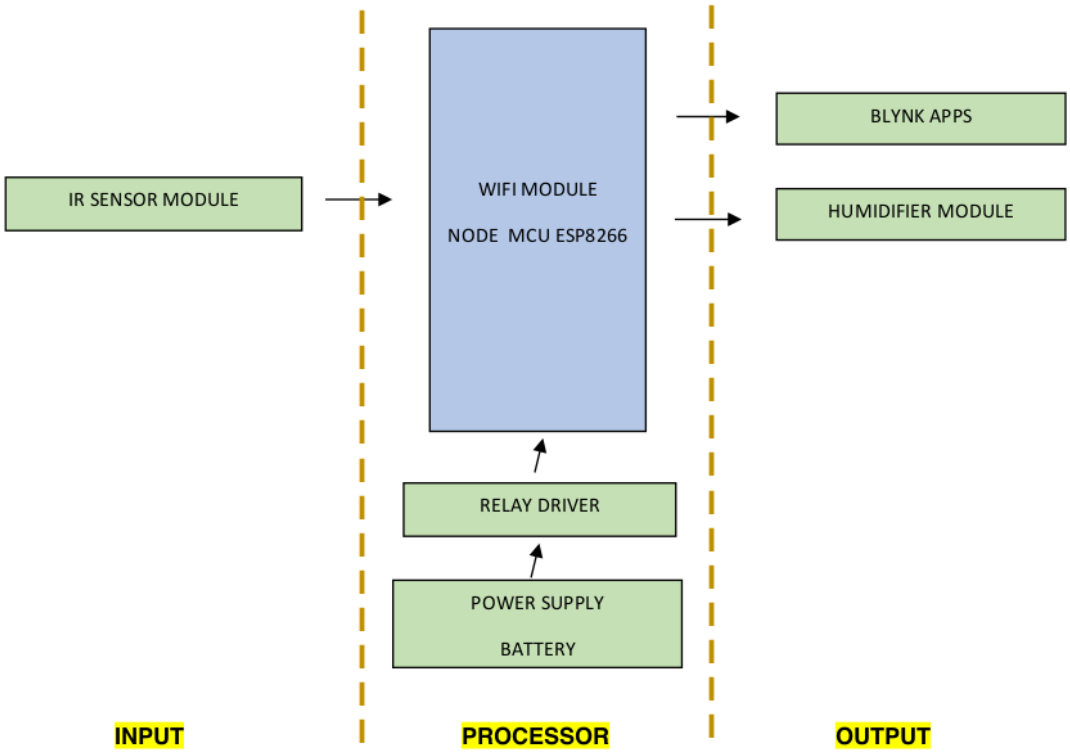


Figure 3.2.1: Block Diagram of the Project

3.2.2 Flowchart of the Project 2

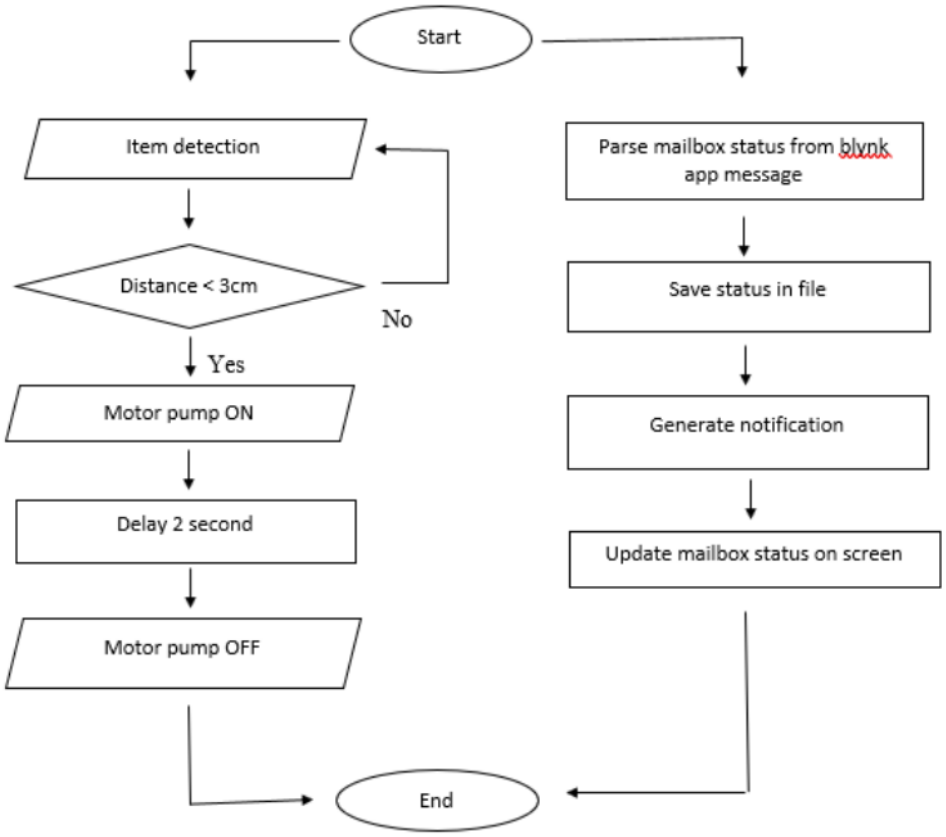


Figure 3.2.2: Flowchart of the Project

3.2.3 Project Description

For this project, when the item or parcels are arrived in the mailbox, the notification will pop out in the email's users. Also, the item will be automatic sanitize to prevent any viruses. The item are also in a safe condition.

3.3 Project Hardware

This section contains specifications of the hardware and components involved in the development of this project.

Hardware Specification :

- Humidifier Module
- IR Sensor Module
- ESP8266 WiFi
- Servo Motor

3.3.1 Schematic Circuit

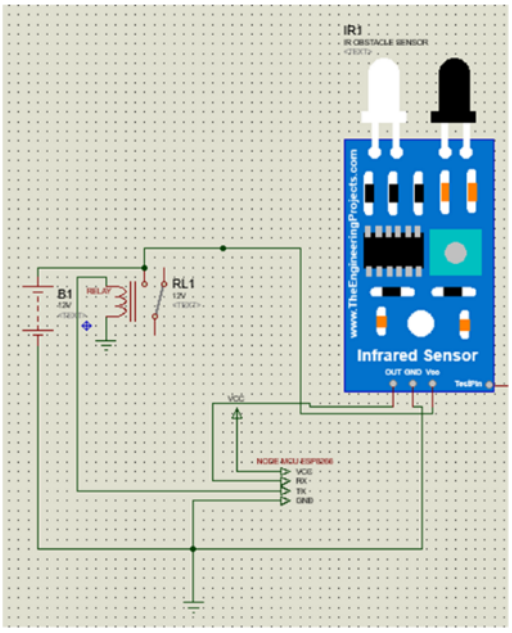


Figure 3.3.1: Schematic Circuit

3.3.2 Description of Main Component

This section contains details components involved in development of this project.

3.3.2.1 Humidifier Module

A humidifier is a device that increases humidity by releasing water vapour or steam. These can be used to create home heating and cooling systems. A fan draws air from the surrounding environment and pushes it into the humidifier, which works as a moisture humidifier. Because there is water in the air, it is humid. It's ideal for hotter locations because it cools the air as it works.

Humidity refers to the amount of moisture in the air. In the air, there is a certain amount of water vapour. Every quantity of air can carry a certain amount of water vapour, which is determined by its temperature: The warmer the air is, the more water it can hold. A low relative humidity suggests that the air is dry and could store a lot more moisture at that temperature.

3.3.2.2 IR Sensor Module

IR technology is used in a wide range of wireless applications which includes remote controls and sensing. The infrared part in the electromagnetic spectrum can be separated into three main regions: near IR, mid-IR & far IR. The wavelengths of these three regions vary based on the application. For the near IR region, the wavelength ranges from 700 nm- 1400 nm, the wavelength of the mid-IR region ranges from 1400 nm – 3000 nm & finally for the far IR region, the wavelength ranges from 3000 nm – 1 mm.

The near IR region is used on fiber optic & IR sensors, the mid-IR region is used for heat sensing and the far IR region is used in thermal imaging. The range of frequency for IR is maximum as compared to microwave and minimum than visible light. This article discusses an overview of the IR sensor and its working.The IR sensor or infrared sensor is one kind of electronic component, used to detect specific characteristics in its surroundings through emitting or detecting IR radiation. These sensors can also be used to detect or measure the heat of a target and its motion. In many electronic devices, the IR sensor circuit is a very essential module. This kind of sensor is similar to human's visionary senses to detect obstacles.

3.3.2.3 ESP8266 WiFi Module

The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, that we can simply hook this up to your Arduino device and get about as much WiFi-ability as a WiFi Shield offers (and that's just out of the box)! The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

This module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, including the front-end module, is designed to occupy minimal PCB area. The ESP8266 supports APSD for VoIP applications and Bluetooth co-existance interfaces, it contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF parts.

3.3.2.4 Servo Motor

A **servomotor** is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration.[1] It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with Servo motors are not a specific class of motor, although the term *servomotor* is often used to refer to a motor suitable for use in a closed-loop control system. Servo motors are used in applications such as robotics, CNC machinery or automated manufacturing.

A servomotor is a closed-loop servomechanism that uses position feedback to control its motion and final position. The input to its control is a signal (either analogue or digital) representing the position commanded for the output shaft.

The motor is paired with some type of position encoder to provide position and speed feedback. In the simplest case, only the position is measured. The measured position of the output is compared to the command position, the external input to the controller. If the output position differs from that required, an error signal is generated which then causes the motor to rotate in either direction, as needed to bring the output shaft to the appropriate position. As the positions approach, the error signal reduces to zero and the motor stops.

3.4 Circuit Operation

The Circuit diagram for this project is shown in the figure above. IR sensor module will be connected to Arduino uno. The Atmega328 provides UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An Atmega16U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. Then, servo motor and WiFi module ESP8266 will connected to Arduino uno 3V3. A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.

3.5 Project Software

These project will use 2 development software :

Proteus 8

The Proteus Design Suite is a proprietary software tool suite used primarily for electronic design automation. The software is used mainly by electronic design engineers and technicians to create schematics and electronic prints for manufacturing printed circuit boards.

The Proteus Design Suite is a Windows application for schematic capture, simulation, and PCB layout design. It can be purchased in many configurations, depending on the size of designs being produced and the requirements for microcontroller simulation. All PCB Design products include an autorouter and basic mixed mode SPICE simulation capabilities.

Arduino IDE

The Arduino Integrated Development Environment – or Arduino Software (IDE) – is a software tools that can be use to develop structure code for the Arduino controller. It 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 and Genuino hardware to upload programs and communicate with them.

3.6 Flowchart of the System

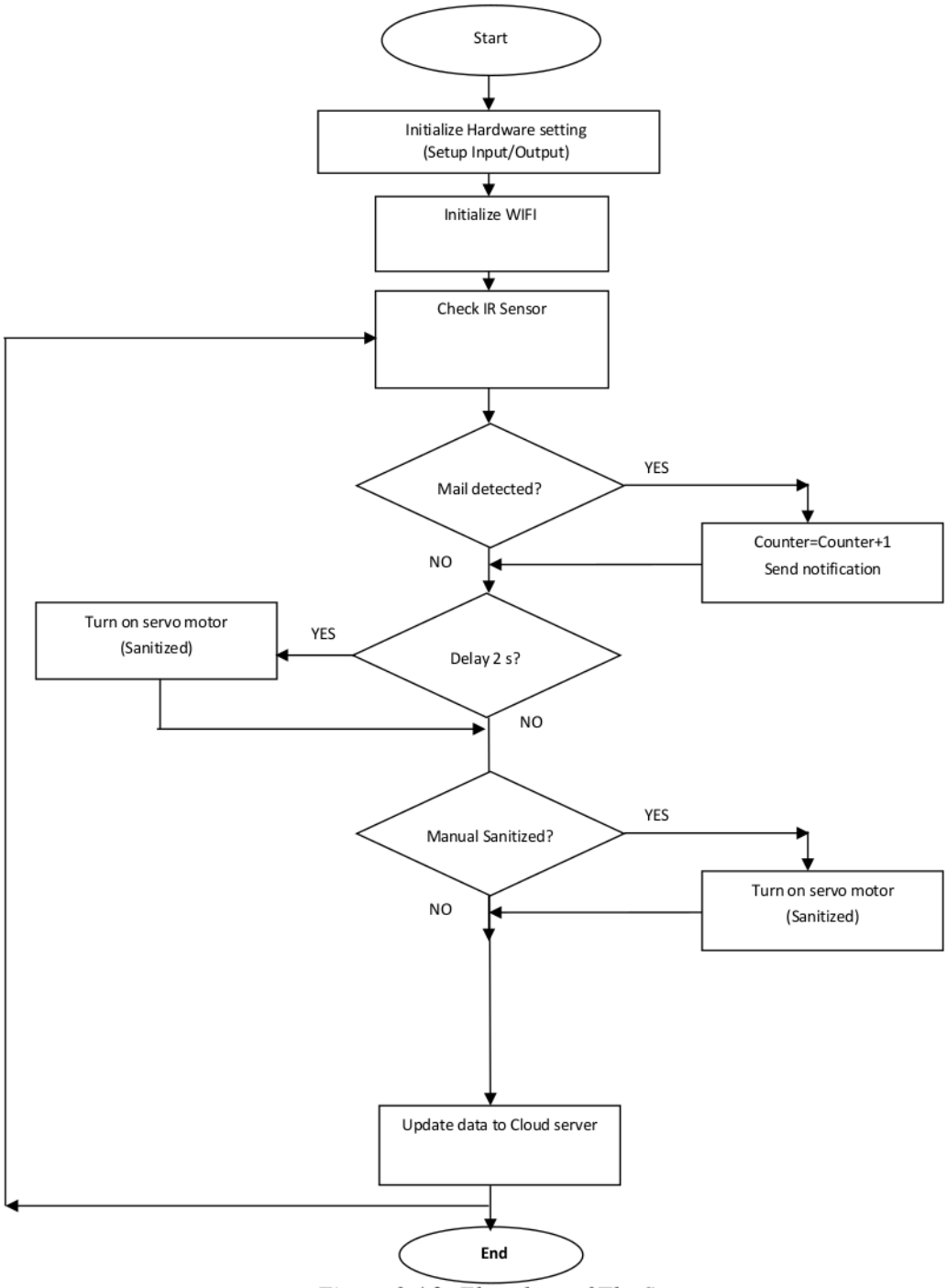


Figure 3.4.2: Flowchart of The System

3.6.1 Description of Flowchart

Any flowchart will begin with ‘ Start ‘ command. Next, hardware setting to setup Input/Output then will connected to WIFI. IR sensor will detect the item in mail. After detect the item, the notification will be sent and delay. Servo motor, function for sanitized. Then, it will be updated data to Cloud Server. Lastly, the flowchart will ending with ‘ End ‘ command.

3.6.2 Prototype Development

The design of my project is the size should be suitable to be placed in the place that has been targeted. Especially in residential areas. This smart home mailbox was created to make it easier for people not to have to worry about whether the goods have arrived safely or not in the mailbox because when the goods have arrived, a notification will be sent by post. My target group in this project is people who are not often at home and people who are busy with outside things. This is because this type of person has limitations of movement and abilities. In addition, I also target the career group because they are always busy and have no time. So this smart home mailbox is specially created to make it easier for people to know that their goods are in a safe condition. This mailbox also has an auto sanitizer to prevent bacteria and viruses.

3.6.3 Mechanical Design/Product Layout

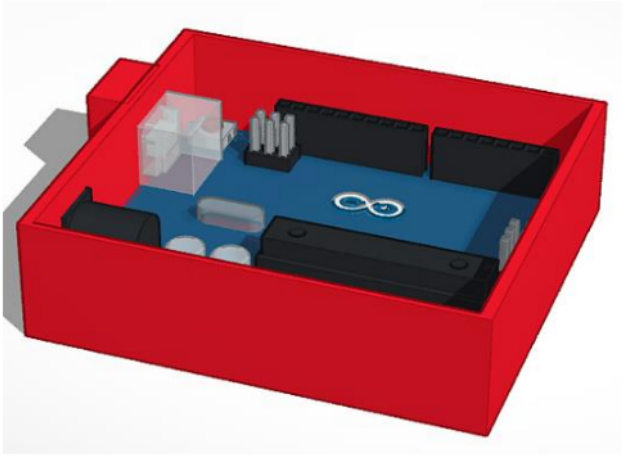


Figure 3.5.1: Mechanical Design/Product Layout

3.6.4 Sustainability Element in The design Concept

The design concept of my project have been designed using Tinkercad. This smart home mailbox is suitable for an array of modern day deliveries. The smart mailbox has a secure mail storage area, ensuring that mail theft is no longer a concern.

3.7 Chapter Summary

In this chapter of research methodology, each project will adopt a particular technique to ensure that it is successful and runs smoothly. The research format, project completion techniques, and relevant project components have all been described in this chapter. The components are chosen based on their cost and function. It also gives an overview of the process and explains the definitions and criteria that were employed. This section also includes an overview of schematic circuits and hardware projects, as well as the components that were used.

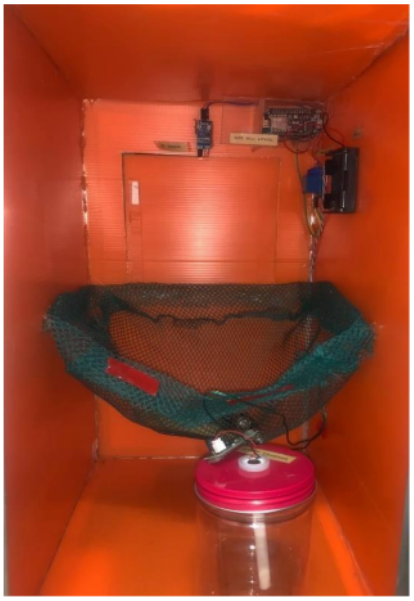
CHAPTER 4

RESULTS AND DISCUSSION

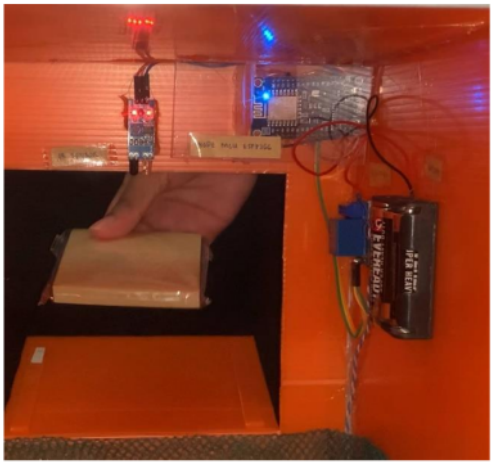
4.1 Introduction

Smart home mailbox is a mailbox that uses an application to notify when a parcel has arrived. it also has an automatic sanitizer. This box is useful for people who sit in high -rise condo/apartment houses, people who are busy working so they rarely check the mailbox of the house and also people who work. IR sensor is used to detect the parcel entering the crate, the sensor light will light up both when it detects the parcel. Node mcu esp8266 connect with Blynk Apps.There are various obstacles to overcome in order for a commercial product to succeed. The most difficult task is to create a product that is both cost effective and durable. It should also be straightforward to use.

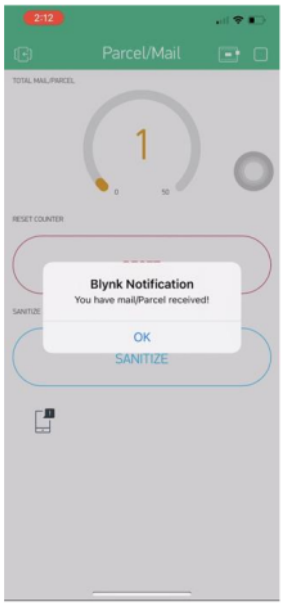
4.2 Result and Analysis



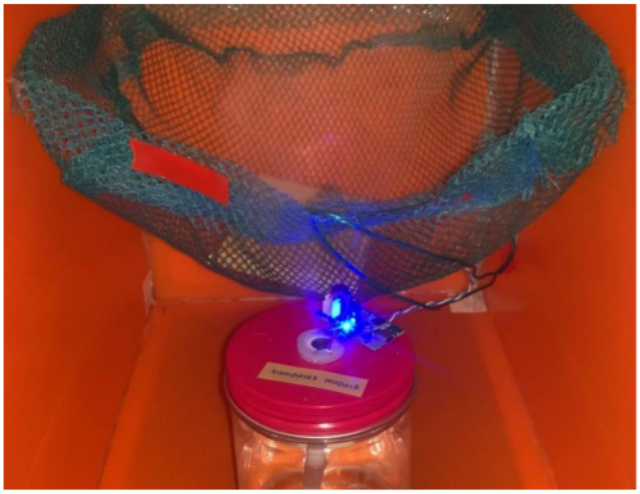
Smart mailboxes, which keep track of all deliveries, are an essential part of the future home. As a result, users may track delivery items in real time. The project's purpose was to look into and compare mail and data transfer detection methods from mailbox to home. The three steps of the research include market research for availability technology, experimental data collection, cost analysis, and solution comparison.



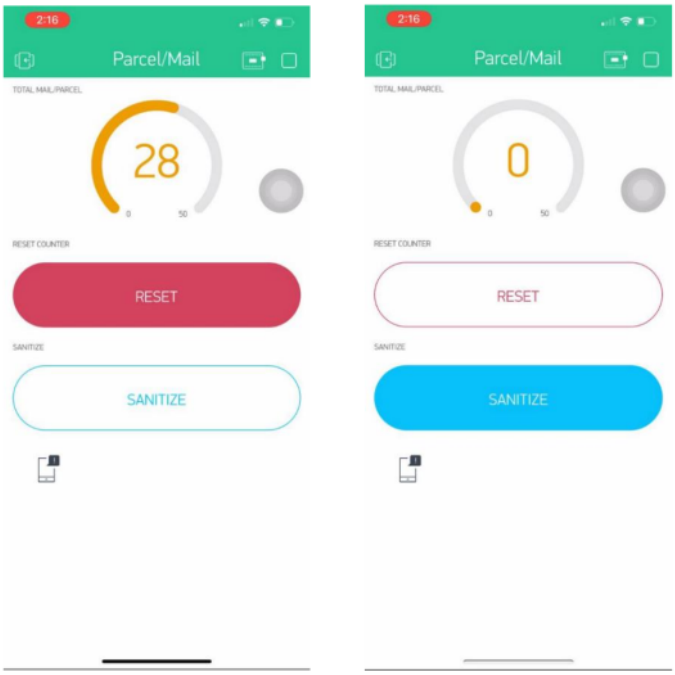
This project circuit was connected to WiFi/Hotspot and all the components was connected to power supply (Battery). The light from IR Sensor and Node MCU Esp8266 were working perfectly although it takes a few seconds delay to see the result. Output in the circuit are working properly. Light from Node MCU Esp8266 and IR Sensor will turn on both when the parcel is received in the mailbox.



This notification is shown that the Blynk Apps show the notification when the parcel is received.



This humidifier module will turn on light when the parcel is received, because it will automatically sanitize. It working perfectly.



The RESET button to reset the counter of parcel when almost full or already full.

Then, for SANITIZE button is to sanitize the parcel manually.

4.3 Discussion

This project focuses on parcels that have arrived in safe condition. in this modern age, there are not many more boxes that can connect to a phone and that have an automatic sanitizer. the input for this project is on IR money sensor can detect parcel. while, the output is on the humidifier module to sanitize the parcel that has entered the box

4.4 Chapter Summary

This chapter represents the result and analysis that have been made during the process of the project. Smart Home Mailbox is a project that can make it easier for users who are busy working or sitting in a high -rise house. it is very helpful when someone is away from the mailbox, it will still give notification by phone and do not have to worry about the parcel because it is always in a clean condition because it has automatic sanitizer in the mailbox.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

After the project has been tested and proved to be functional, a conclusion must be reached to ensure that the project's objectives and scope were met. This chapter outlines a conclusion that may be drawn from the entire two-semester process of developing this project. Aside from that, any mistake or testing from this project can be applied to this chapter.

5.2 Conclusion

The first chapter introduces the project's background, problem statement, objectives, and scope. Chapter 1 is an introduction to smart home mailbox project, including how it works, the problems it solves, and its objectives. This isn't the first effort of its kind, and it's been given a number of different names and designs for various applications.

For chapter 2, it introduces a literature review that used to build Smart Home Mailbox. For this study, multiple literature reviews were conducted. These are helpful in methodological investigations since they look at the strengths and flaws of previous research on the same topic. Literature reviews also aid in the construction of a theoretical framework consisting of research concepts and ideas whose success can be measured, as well as providing information on research relevance and consistency.

For chapter 3, it introduces the methodology for smart home mailboxes. A system of methods employed in a project is referred to as methodology. This chapter covers the project overview, block diagrams, flow charts, and other aspects of the Smart Home Mailboxes manufacturing process. The block diagram for this project has three parts: input, process, and output. The flow chart depicts the project's workflow: data from the input is processed and transmitted to the output, which displays the input's outcomes. A overview of schematic plots and hardware projects, as well as essential components, are also included in this chapter.

For chapter 4, it describes the results and analysis of this project after the components have been installed and the coding has been uploaded to the ESP8266 MCU Node. IR Sensor is used to detect parcels entering the mailbox. The circuit outputs all work. The number of LEDs on the IR sensor will light up both when detecting a parcel. The IR Sensor connects the ESP8266 MCU Node to an application on the smartphone and displays the number of incoming parcels. When the parcel enters, the sanitizer will come out automatically. This project was created to facilitate users and employees in the office.

5.3 Suggestion for Future Work

The suggestion for future work is to use more compatible components. This project can be used as a demonstration of how the project might be if using better components. For future mailboxes, you can add a camera in it. Moreover, the project shows that the project can be enhanced in various ways such as using more sensors and suitable humidifiers.

5.4 Chapter Summary

This chapter brings the previous chapters to a close. Chapter 1 concludes the project's introduction, chapter 2 concludes the literature reviews, chapter 3 concludes the methodology, and chapter 4 concludes the project's outcomes and analysis. Aside from that, this chapter includes suggestions for future development for future reference.

CHAPTER 6

PROJECT MANAGEMENT AND COSTING

6.1 Introduction

Project and Cost Management is an important component since it outlines and illustrates the management decisions made throughout the project's execution and presentation using a Gantt Chart. This is incredibly important since we can easily see how far we've come in completing this project, from planning and gathering information to the project being completed on time. In addition, the cost of expenditure is described in order to see how much money was spent on the project. We can view the cost of each purchased component and estimate the project's budget.

6.2 Gant Chart and Activities of the Project

POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

GANTT CHART OF THE PROJECT IMPLEMENTATION
ELECTRICAL ENGINEERING DEPARTMENT
SESI 2 2021/2022

	WEEK	1	2	3	4	5	6	7	8		9	10	11	12	13	14
	DATE	7/3/2022 - 11/3/2022	14/3/2022-18/3/2022	21/3/2022-25/3/2022	28/3/2022-1/4/2022	4/4/2022-8/4/2022	11/4/2022-15/4/2022	18/4/2022-22/4/2022	25/4/2022-29/4/2022		9/5/2022-13/5/2022	16/5/2022-20/5/2022	23/5/2022-27/5/2022	30/5/2022-3/6/2022	6/6/2022-10/6/2022	13/6/2022-17/6/2022
1	Project 1(DEE40082) Briefing to Supervisor									MID TERM BREAK						
2	Project 1(DEE40082) Briefing to Student															
3	Selection and approval of project title															
4	Presentation 1(Idea)															
5	Project Registration															
6	Change project title (if any)															
7	Submit Investigation Report															
8	Submit Proposal to Supervisor															
9	**Project 1 Proposal Approval (investigation report)**															
10	**Assessment Evaluation 1 (Logbook, investigation report)**															
11	Final proposal writing report															
12	Mini Project construction															
13	**Presentation 2 (Final Proposal)**															
14	**Assessment Evaluation 2 (Logbook, final proposal and mini project)**															

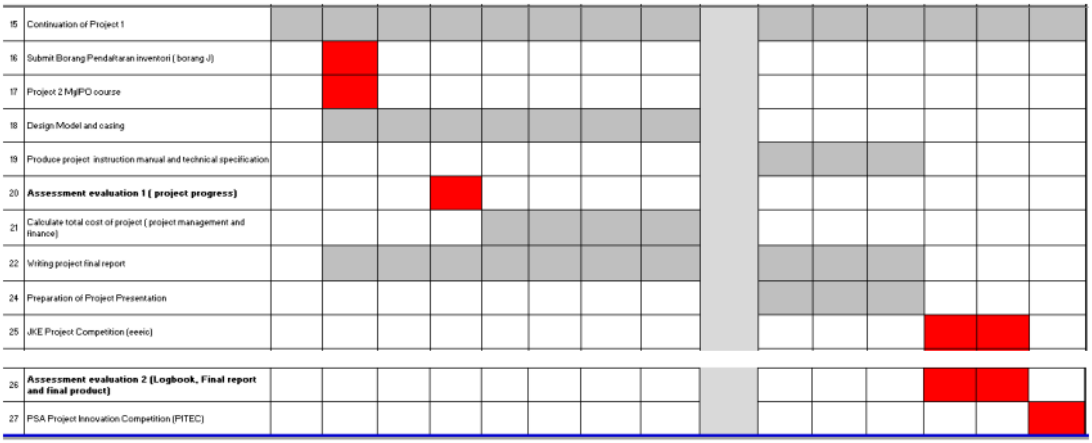
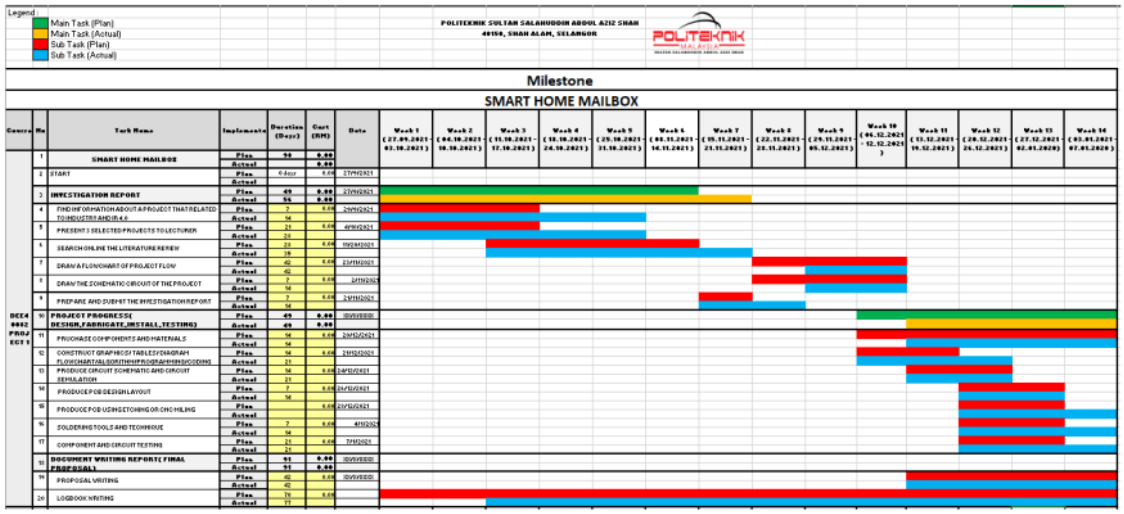


Figure 6.2: Gant Chart and Activities of the Project

6.3 Milestone



Legend :
Main Task (Plan)
Main Task (Actual)
Sub Task (Plan)
Sub Task (Actual)

POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
40150, SHAH ALAM, SELANGOR

Milestone

SMART HOME MAILBOX

Course	No	Task Name	Implementation	Duration (Days)	Cost (RM)	Date	Week 1 (27.09.2021 - 03.10.2021)	Week 2 (04.10.2021 - 10.10.2021)	Week 3 (11.10.2021 - 17.10.2021)	Week 4 (18.10.2021 - 24.10.2021)	Week 5 (25.10.2021 - 31.10.2021)	Week 6 (01.11.2021 - 14.11.2021)	Week 7 (15.11.2021 - 21.11.2021)	Week 8 (22.11.2021 - 28.11.2021)	Week 9 (29.11.2021 - 05.12.2021)	Week 10 (06.12.2021 - 12.12.2021)	Week 11 (13.12.2021 - 19.12.2021)	Week 12 (20.12.2021 - 26.12.2021)	Week 13 (27.12.2021 - 02.01.2020)	Week 14 (03.01.2021 - 07.01.2020)
DEC4 6002 PROJECT 1	1	SMART HOME MAILBOX	Plan	98	0.00															
			Actual		0.00															
	2	START	Plan	0 day	0.00	27/09/2021														
			Actual																	
	3	INVESTIGATION REPORT	Plan	49	0.00	27/09/2021														
			Actual	56	0.00															
	4	FIND INFORMATION ABOUT A PROJECT THAT RELATED TO INDUSTRY 4.0	Plan	7	0.00	29/09/2021														
			Actual	14																
	5	PRESENT 3 SELECTED PROJECTS TO LECTURER	Plan	21	0.00	4/10/2021														
			Actual	28																
	6	SEARCH ONLINE THE LITERATURE REVIEW	Plan	21	0.00	11/10/2021														
			Actual	28																
	7	DRAW A FLOWCHART OF PROJECT FLOW	Plan	42	0.00	13/11/2021														
			Actual	42																
	8	DRAW THE SCHEMATIC CIRCUIT OF THE PROJECT	Plan	7	0.00	2/11/2021														
			Actual	14																
	9	PREPARE AND DUBMIT THE INVESTIGATION REPORT	Plan	7	0.00	2/11/2021														
			Actual	14																
	10	PROJECT PROGRESS(DESIGN,FABRICATE,INSTALL,TESTING)	Plan	49	0.00	05/01/2020														
			Actual	49	0.00															
	11	PRUCHASE COMPONENTS AND MATERIALS	Plan	14	0.00	2/11/2021														
			Actual	14																
	12	CONSTRUCT GRAPHICS TABLES/DIAGRAM FLOWCHART/ALGORITHM/PROGRAMMING/CODING	Plan	14	0.00	11/11/2021														
			Actual	21																
	13	PRODUCE CIRCUIT SCHEMATIC AND CIRCUIT SIMULATION	Plan	14	0.00	16/11/2021														
			Actual	21																
	14	PRODUCE PCB DESIGN LAYOUT	Plan	7	0.00	23/11/2021														
			Actual	14																
	15	PRODUCE PCB USING ETCHING OR CNC MILING	Plan		0.00	23/11/2021														
			Actual																	
	16	SOLDERING TOOLS AND TECHNIQUE	Plan	7	0.00	4/12/2021														
			Actual	14																
	17	COMPONENT AND CIRCUIT TESTING	Plan	21	0.00	7/12/2021														
			Actual	21																
	18	DOCUMENT WRITING REPORT(FINAL PROPOSAL)	Plan	91	0.00	05/01/2020														
			Actual	91	0.00															
	19	PROPOSAL WRITING	Plan	42	0.00	05/01/2020														
			Actual	42																
	20	LOGBOOK WRITING	Plan	70	0.00															
			Actual	77																

Course	23	Task Name	Implementation	Duration (Days)	Cost (RM)	Date	Week 1 (16.09.2020 - 15.09.2020)	Week 2 (17.09.2020 - 23.09.2020)	Week 3 (24.09.2020 - 30.09.2020)	Week 4 (31.09.2020 - 06.09.2020)	Week 5 (07.09.2020 - 13.09.2020)	Week 6 (14.09.2020 - 20.09.2020)	Week 7 (21.09.2020 - 27.09.2020)	Week 8 (05.10.2020 - 11.10.2020)	Week 9 (12.10.2020 - 18.10.2020)	Week 10 (19.10.2020 - 25.10.2020)	Week 11 (26.10.2020 - 01.11.2020)	Week 12 (02.11.2020 - 08.11.2020)	Week 13 (09.11.2020 - 15.11.2020)	Week 14 (16.11.2020 - 22.11.2020)
DEC4 1062 PROJECT 2	22	INSTALLATION	Plan	84	0.00	01/01/2020														
			Actual	84	0.00															
	23	INSTALLATION OF COMPONENTS ON PCB	Plan	35	0.00	23/09/2020														
			Actual	42																
	24	INSTALLATION OF WIRING	Plan	21	0.00															
			Actual	28																
	25	INSTALLATION OF SOFTWARE	Plan	28	0.00	23/09/2020														
			Actual	49																
	26	INSTALLATION OF CONTROL CIRCUIT / SYSTEM	Plan	42	0.00															
			Actual	42																
	27	INSTALLATION OF PROJECT CASING	Plan	21	0.00	23/09/2020														
			Actual	28																
	28	TESTING	Plan	91	0.00	05/10/2020														
			Actual	91	0.00															
	29	TEST THE ELECTRONIC PART	Plan	28	0.00	23/09/2020														
			Actual	42																
	30	TEST THE MECHANICAL PART	Plan	21	0.00	23/09/2020														
			Actual	28																
	31	TEST THE OVERALL PROCESS / PROJECT	Plan	21	0.00	23/09/2020														
			Actual	28																
	32	DOCUMENTS	Plan	98	0.00	05/10/2020														
			Actual	98	0.00															
	33	PREPARATION OF SLIDE PRESENTATION	Plan	21	0.00															
			Actual	28																
	34	PREPARATION OF LOGBOOK	Plan	91	0.00															
			Actual	105																
	35	PREPARATION OF PROJECT 2 FINAL REPORT	Plan	91	0.00	23/09/2020														
			Actual	91																
	36	PREPARATION OF INSTRUCTION MANUAL	Plan	42	0.00															
			Actual	49																
	37	END	Plan	7		23/09/2020														
			Actual	7																

6.4 Costing and Budgeting

The cost of procuring components and materials for this project will be incurred during its implementation. Hardware Arduino UNO, IR Sensor Module, ESP 8266 WiFi, Servo Motor, and other materials are cost-involved components. To make things easier and save money, all of these components are obtained through internet purchasing methods.

LIST OF COMPONENT

No	Component Description	Quantity	Price/Unit	Total Price
1	Arduino UNO atmega based	1	RM 31.99	RM 31.99
2	Wifi ESP8266	1	RM 15.50	RM 15.50
3	Casing box	1	RM 40.00	RM 40.00
4	Male to female wire jumper	1	RM 4.29	RM 4.29
5	Female to female jumper wire	1	RM 4.29	RM 4.29
6	USB Cable	1	RM 29.90	RM 29.90
7	IR Sensor module	1	RM 2.18	RM 2.18
8	Servo motor	1	RM 16.65	RM 16.65
9	Mini Hand sanitizer	1	RM 6.00	RM 6.00
			Total :	RM150.80
	List of other costing			
1	Postage			RM 32
2	Craft work			-
3	Internet			RM 98
4	Application			-
			Total :	RM 130
			Overall Total	RM 280.80

Table 4.0: Costing and Budgeting

6.5 Chapter Summary

In this chapter, I've detailed and illustrated a Gant Chart that depicted the progress of my project from the start to completion. The cost of expenses that I used to purchase components and items for this project is then described. We may view the pricing of each component as well as the project's other costs in detail.

REFERENCES

[1] B. Nath, F. Reynolds, and R. Want, "Rfid technology and applications," IEEE Pervasive computing, vol. 5, no. 1, pp. 22–24, 2006. DOI: 10.1109/MPRV.2006.13.

[2] Sigfox. Dutch smart mailbox, Parcer, chooses Aerea SIGFOX-network. Available at: https://www.sigfox.com/en/news/dutch-smart-mailbox-parcer-chooses-aerea-sigfox-network

[3] If This Then That (IFTTT). Available online: https://ifttt.com/ (accessed on 2 July 2020).

[4] Webhooks. Available online: https://ifttt.com/maker_webhooks (accessed on 7 July 2020).

[5] X. Zhang, Q. Dong, and F. Hu, "Applications of rfid in logistics and supply chains: An overview," ICLEM 2012: Logistics for Sustained Economic Development—Technology and Management for Efficiency, pp. 1399–1404, 2012. DOI: 10.1061/9780784412602.0213.

[6] S. N Shukla, T.A. Champaneria, "Survey of various data collection ways for smart transportation domain of smart city", 2017 International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC), DOI: 10.1109/I-SMAC.2017.8058265, 2017.

[7] Rizki Priya Pratama. (2017). Application Wireless Sensor ESP8266 for Smart Home Automation.

7 APPENDICES

APPENDIX A – PROGRAMMING

```
#include <SoftwareSerial.h>


SoftwareSerial ss(2, 3); //(RX,TX)

#define IR1 A0
#define Buzz 5
#define PUMP 10

int Counter=0;
int MODE=0;

int pos=0;



void setup() {
 Serial.begin(9600);
 ss.begin(9600);


pinMode(PUMP,OUTPUT);
digitalWrite(PUMP,HIGH);
 pinMode(IR1,INPUT);
  pinMode(Buzz,OUTPUT);

}

void loop() {


if (digitalRead(IR1)==0){
 Counter++;
 ss.print("*");
  ss.print(Counter);
```

```
   ss.println("#");
Serial.println("Mail/Parcel received");
delay(1000);
digitalWrite(PUMP,LOW);

 delay(4000);
 digitalWrite(PUMP,HIGH);
}

  delay(150);



}

void serialEvent() {
  while (Serial.available()) {
    // get the new byte:
    char inChar = (char)Serial.read();

  }
}
```

APPENDIX B – GANT CHART OF THIS PROJECT

POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

GANTT CHART OF THE PROJECT IMPLEMENTATION
ELECTRICAL ENGINEERING DEPARTMENT
SESI 2 2021/2022

	WEEK	1	2	3	4	5	6	7	8		9	10	11	12	13	14
	DATE	7/3/2022 - 11/3/2022	14/3/2022-18/3/2022	21/3/2022-25/3/2022	28/3/2022-1/4/2022	4/4/2022-8/4/2022	11/4/2022-15/4/2022	18/4/2022-22/4/2022	25/4/2022-29/4/2022		2/5/2022-13/5/2022	16/5/2022-20/5/2022	23/5/2022-27/5/2022	30/5/2022-3/6/2022	6/6/2022-10/6/2022	13/6/2022-17/6/2022
1	Project 1(DEE40082) Briefing to Supervisor															
2	Project 1(DEE40082) Briefing to Student															
3	Selection and approval of project title															
4	Presentation 1(Idea)															
5	Project Registration															
6	Change project title (if any)															
7	Submit Investigation Report															
8	Submit Proposal to Supervisor															
9	**Project 1 Proposal Approval (investigation report)**															
10	**Assessment Evaluation 1 (Logbook, investigation report)**															
11	Final proposal writing report															
12	Mini Project construction															
13	**Presentation 2 (Final Proposal)**															
14	**Assessment Evaluation 2 (Logbook, final proposal and mini projeot)**															
										MID TERM BREAK						
15	Continuation of Project 1															
16	Submit Borang Pendaftaran inventori (borang J)															
17	Project 2 MyIPO course															
18	Design,Model and casing															
19	Produce project instruction manual and technical specification															
20	**Assessment evaluation 1 (project progress)**															
21	Calculate total cost of project (project management and finance)															
22	Writing project final report															
24	Preparation of Project Presentation															
25	JKE Project Competition (eeeic)															
26	**Assessment evaluation 2 (Logbook, Final report and final product)**															
27	PSA Project Innovation Competition (PITEC)															

APPENDIX C – USER MANUAL

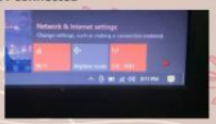
POLITEKNIK MALAYSIA
Sultan Salahuddin Abdul Aziz

Instruction Manual :

1. Install batteries to power all components.

2. Turn On HOTSPOT at our laptop or another smart phone to connect the Blynk app in our phone.

HOTSPOT connected



3. Open Blynk app

4. When the parcel has entered the box, the message will be notified via smart phone notification.

5. After the item is put in the mailbox, select the command we want to reset/sanitize again.

6. Lastly , turn off HOTSPOT then the Blynk application will automatically offline.

Final Report Project 2

ORIGINALITY REPORT

0%	0%	0%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

Exclude quotes	On	Exclude matches	< 18%
Exclude bibliography	On		