POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

PARKING OKU USING SMARTCARD

NAME	REGISTRATION NO
1. NUR ANIS KARMILA BINTI RAMLI	08DEU20F2024

JABATAN KEJURUTERAAN ELEKTRIK

SESI 2 20222/2023

POLITEKNIK

SULTAN SALAHUDDIN ABDUL AZIZ SHAH

PARKING OKU USING SMARTCARD

NAME	REGISTRATION NO
1.NUR ANIS KARMILA BINTI RAMLI	08DEU20F2024

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

JABATAN KEJURUTERAAN ELEKTRIK

SESI 2 2021/2022

CONFIRMATION OF THE PROJECT

The project report titled "Parking OKU using Smartcard" has been submitted, reviewed and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

Checked by:

Supervisor's name : IRMA BAIZURI BINTI MOHD AKHIR

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 ANIS KARMILA BINTI RAMLI**

Registration Number : **08DEU20F2024**

Date : 25 MAY 2023

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : PARKING OKU USING SMARTCARD

SESSION: SESI 2: 2022/2023

1. I, **1. NUR ANIS KARMILA BINTI RAMLI, 08DEU20F2024**

   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,40140 Shah Alam Selangor Darul Ehsan**. (Hereinafter referred to as 'the Polytechnic').

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

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

Made and in truth that is recognized by;

a) **NUR ANIS KARMILA BINTI RAMLI** (Identification card No: - 020926010500)

) .
....…….
) **NUR ANIS KARMILA BINTI RAMLI**

In front of me, **IRMA BAIZURI BINTI MOHD AKHIR** (Click here to enter text.)
As a project supervisor, on the date:

) ....……
) **IRMA BAIZURI BINTI MOHD AKHIR**

ACKNOWLEDGEMENTS

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

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

My thanks and appreciations also go to my colleague in developing the Project and people who have willingly helped me out with their abilities.

ABSTRACT

The disabled people in Malaysia is known as Orang Kurang Upaya (OKU). OKU people are given some privileges such as having their own car parking lot.
However, said parking lot is often being abused by citizen who lacks awarenessand civic. This paper presents a system that use preventive measure at the early stage to prevent citizen from abusing the parking lot. The system proposes an installation of a mechanical barrier inside the parking lot that prevents people from entering it. The parking can only be accessed through an OKU RFID card issued by local authorities. Upon successful verification, the mechanical barrier will lower down and the user can use the parking lot. The implementation of thesystem is expected to prevent citizen from abusing the OKU parking lot and improve the quality of life for them.

Keywords— Parking system, sensors, safety

ABSTRAK

Orang kurang upaya di Malaysia dikenali sebagai Orang Kurang Upaya (OKU). Golongan OKU diberi beberapa keistimewaan seperti mempunyai tempat letak kereta sendiri.

Bagaimanapun, katanya tempat letak kereta sering disalahgunakan oleh rakyat yang kurang kesedaran dan sivik. Kertas kerja ini membentangkan satu sistem yang menggunakan langkah pencegahan pada peringkat awal untuk mengelakkan rakyat daripada menyalahgunakan tempat letak kereta. Sistem ini mencadangkan pemasangan penghadang mekanikal di dalam tempat letak kereta yang menghalang orang ramai daripada memasukinya. Tempat letak kereta hanya boleh diakses melalui kad RFID OKU yang dikeluarkan oleh pihak berkuasa tempatan. Setelah pengesahan berjaya, halangan mekanikal akan menurun ke bawah dan pengguna boleh menggunakan tempat letak kereta. Pelaksanaan sistem itu diharap dapat mengelakkan rakyat daripada menyalahgunakan tempat letak kereta OKU dan meningkatkan kualiti hidup mereka.

Kata kunci— Sistem tempat letak kereta, penderia, keselamatan

TABLE OF CONTENTS

CONFIRMATION OF THE PROJECT **i**
DECLARATION OF ORIGINALITY AND OWNERSHIP **iii**
ACKNOWLEDGEMENTS **iv**
ABSTRACT **v**
ABSTRAK **vi**
TABLE OF CONTENTS **vii**
LIST OF FIGURES **1**
CHAPTER 1 **1**
1 INTRODUCTION **1**
1.1 Introduction 1
1.2 Background Research 1
1.3 Problem Statement 2
1.4 Research Objectives 2
1.5 Scope of Research 2
1.6 Project Significance 3
1.7 Chapter Summary 3
CHAPTER 2 **4**
2 LITERATURE REVIEW **4**
2.1 Introduction 4
2.2 Design and Development of Disabled Parking System 4
2.2.1 Microcontroller 5
2.3 Chapter Summary 5
CHAPTER 3 **6**
3 RESEARCH METHODOLOGY **6**
3.1 Introduction 6
3.2 Project Design and Overview. 6
3.2.1 Block Diagram of the Project 7
3.2.2 Flowchart of the Project 2 7
1.2 Project Hardware 8
3.2.3 Schematic Circuit 9
3.2.4 Description of Main Component 9
3.2.4.1 Component 1 11
3.2.4.2 Component 2 11
3.2.4.3 Component 3 12
3.2.4.4 Component 5 12
3.2.4.5 Component 6 14
3.2.4.6 Component 7 14
3.2.5 Circuit Operation 15
3.2.6 Flowchart of the System 16
3.2.7 Description of Flowchart 16
3.2.8 Mechanical Design/Product Layout 17
3.3 Sustainability Element in The Design Concept 17

3.4 Chapter Summary 17
CHAPTER 4 **18**
4 RESULTS AND DISCUSSION **18**
4.1 Introduction 18
4.2 Results and Analysis 18
4.3 UNCORRECT CARD 20
4.4 Chapter Summary 20
CHAPTER 5 **21**
5 CONCLUSION AND RECOMMENDATIONS **21**
5.1 Introduction 21
5.2 Conclusion 21
5.3 Suggestion for Future Work 21
5.4 Chapter Summary 21
CHAPTER 6 **23**
6 PROJECT MANAGEMENT AND COSTING **23**
6.1 Introduction 23
6.2 Gant Chart and Activities of the Project 23
6.3 Cost and Budgeting 24
6.4 Chapter Summary 26
REFERENCES **27**
7 References **27**
8 APPENDICES **28**
APPENDIX A- PROGRAMMING 28

LIST OF FIGURES

FIGURE **TITLE** **PAGE**

Figure 2:1 image of different between use RFID tag and no RFID tag 4

Figure 3:1 Block Diagram of the project 7

Figure 3:2 Flowchart of operation of the system 8

Figure 3:3 Schematic Circuit..... 9

Figure 3:4 Circuit Operation 15

CHAPTER 1

1 INTRODUCTION

1.1 Introduction

In Malaysia, like most countries, designated disabled spots are reserved for disabled drivers who have a valid disabled permit. We're pretty sure everyoneis more than familiar with the concept of disabled parking spots in Malaysia –larger than average parking spaces with a sign depicting a person sitting in a wheelchair painted on it. Unfortunately, we may also be familiar with seeing cars that have no disabled stickers parked in them or, worse, someone with novisible disabilities getting in or out of the car. Therefore, we can prove that by only using stickers reserved for people with disabilities cannot reduce the selfish attitude of some residents.

1.2 Background Research

In this Parking OKU with Smart Card, I recommend a card scanner system based on the detected Arduino and RFID modules, which will detect whether the card is for people with disabilities or not. If that's for people with disabilities, the system will continue to make bars in the parking lot down and the owner can put them there.

If the scanner detects any abnormal reading is found, which is if the card is not for disabled people, the alarm will be ringing, and the bar not do their work.

1.3 Problem Statement

Nowadays, most people abuse the facilities provided by people with disabilities. For example, parking provided by the government to people withdisabilities has been used arbitrarily by normal people. This makes it difficultfor people with disabilities to use their parking

1.4 Research Objectives

The main objective of this project that have been observed in public car parko that demand the completion of this project is

1. The irresponsibility of some in the abuse of parking that has been reserved by people with disabilities
2. Oku sticker paste system does not affect some parties from using their parking
3. It can be inconvenient for people with disabilities to use the facilities that have been reserved by them if there is a party that is less concerned

1.5 Scope of Research

- The objective of this project is to provide convenience to the disabled by buildingsmart parking cards. This card is special in that it is designed using the identity ofa disabled person.
- The RFID Card System can access the parking lot 4 by touching the card inside the scanner. People with disabilities will touch sensors in the parking lot and thebar will be opened.
- The project includes hardware and software and the project will be realized usingprototypes that mimic the actual functioning of the RFID and Arduino systems. The project focuses on avoiding the irresponsibility of the public. It can also provide convenience to people with disabilities by using smart cards

1.6 Project Significance

A Patient Smart Card is the product. The objectives of the second semester are critical after finishing the entire prototype. The Gantt chart [Appendix Al] summarizes the scheduled tasks and milestones for this semester of the final year project. It covers the complete timetable, from basic design and data structure construction to coding, testing, and report authoring. The project scope appears to be doable for the author to finish on time with the potential outcomes, and the time allowed will be employed efficiently for generating the entire product.

1.7 Chapter Summary

This chapter contains an introduction to the project, which is based on the parking lot. Then, I made a study about the project background, project objectives and project scope for this project.

CHAPTER 2

2 LITERATURE REVIEW

2.1 Introduction

A parking system for individuals with disabilities is important to provide accessible and comfortable parking. RFID technology has been explored as a potential solution to improve the management and enforcement of designated parking spaces for people with disabilities

2.2 Design and Development of Disabled Parking System

it illustrates the suitability of the sensor location on the parking space. The sensor resided at the in front of the parking space as to detect any car entering the parking. In Figure 3 is the illustration of what the situation like when a car with ’true’ RFID tag that can be resembled as the disabled, is the opposite situation when ‘false’ RFID tag is entering the spaces, activating the buzzer and LED to warn the violators.

Figure 2:1 image of different between use RFID tag and no RFID tag

2.2.1 Microcontroller

A microcontroller (sometimes abbreviated µC, uC or MCU) is defined as a small computer on a single integrated circuit containing a processor core, memory, and programmable I/O peripherals. Program memory in the form of NOR flash or OTP ROM is also often included on chip, as well as a typically small amount of RAM Microcontrollers are designed for embedded applications

2.3 Chapter Summary

This chapter is about the literature review of how the RFID work and its related to this project.

CHAPTER 3

3 RESEARCH METHODOLOGY

3.1 Introduction

In methodology, the feasibility study, which served as a preliminary evauation of the data to see whether moving on to the analysis phase was worthwhile, was the first step. It's because the feasibility analysis is the main method for determining whether to move on to the following stage or end the project.

3.2 Project Design and Overview.

As mentioned in the previous chapter, the designed controller uses a closed-loop system with Arduino as the main controller. The design of the controller circuit using Arduino is realized using Proteus Software and then convert to a PCB circuit. This Arduino will give control read the card. For the second output, Arduino will control the gate to open card scanning at the reader.

3.2.1 Block Diagram of the Project

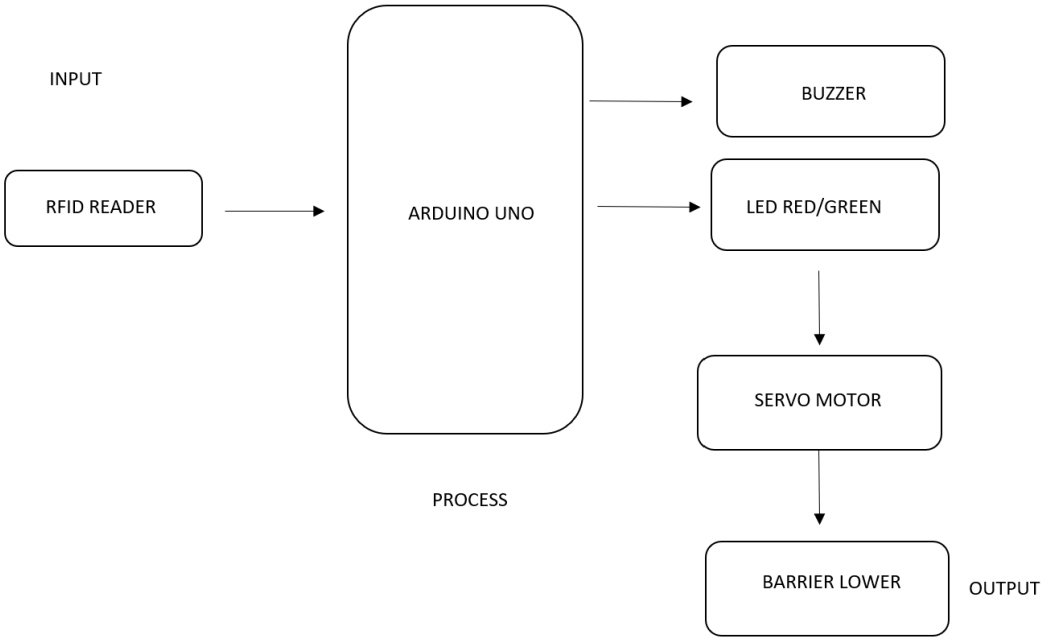


Figure 3:1 Block Diagram of the project

3.2.2 Flowchart of the Project 2

Error! Reference source not found. shows the circuit diagram of the whole system. It is show that we have two way for flowchart. The first flowchart is for detect the car and reading the card. If we follow, we can see at flowchart that we must scan first the card that we have and the scanner will read the data in the card. If the reader detect the true information, then LED green will blinking and the barrier will come down. As for the second type of flowchart, we can see that if reader detect the wrong card than LED red will blinking and the buzzer will sound.

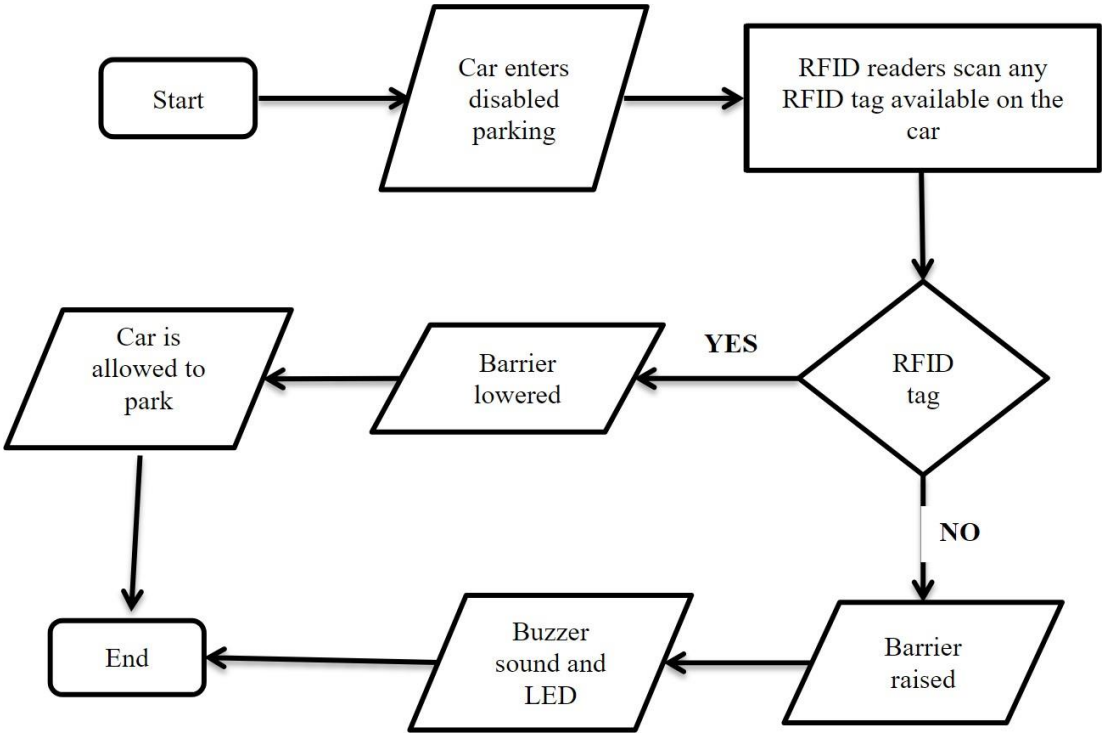


Figure 3:2 Flowchart of operation of the system

1.2 Project Hardware

As mention in the previous chapter, the designed controller is using Arduino Uno. This microcontroller will control and give instructions to all the components in the circuit. Then, we use Arduino RFID RC522 Card Reader. These components content RFID cards and also card readers. We also use LED to give the information for user when the barrier will lowered or not. If the LED red blinking, the barrier will not lowered and if LED green blinking, the barrier will lowered. The buzzer we use to give the sound if the card is not related.

3.2.3 Schematic Circuit

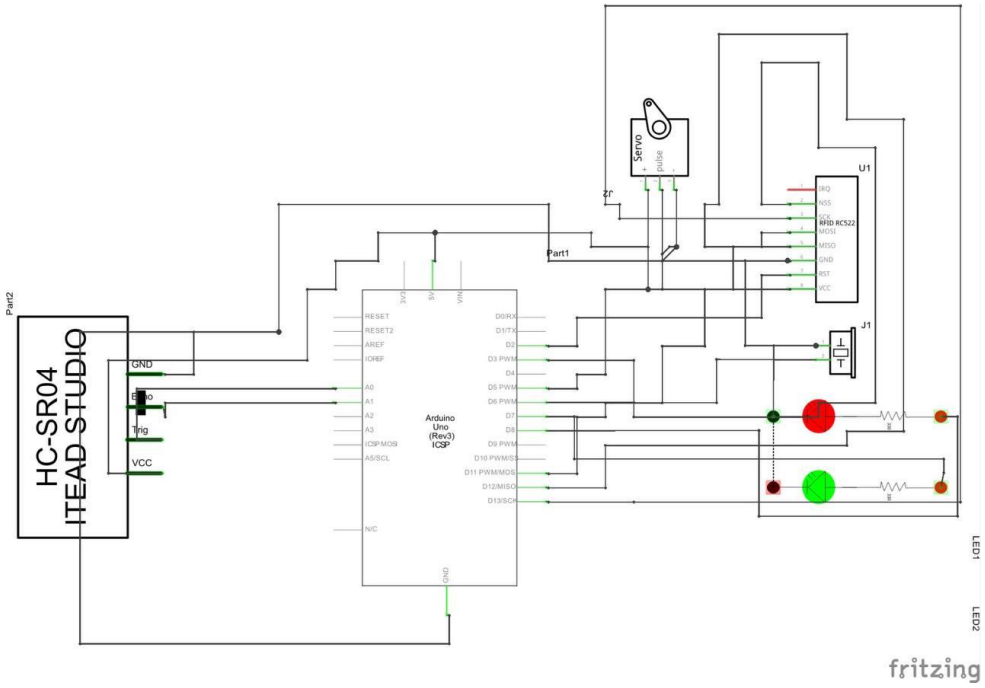


Figure 3:3 Schematic Circuit

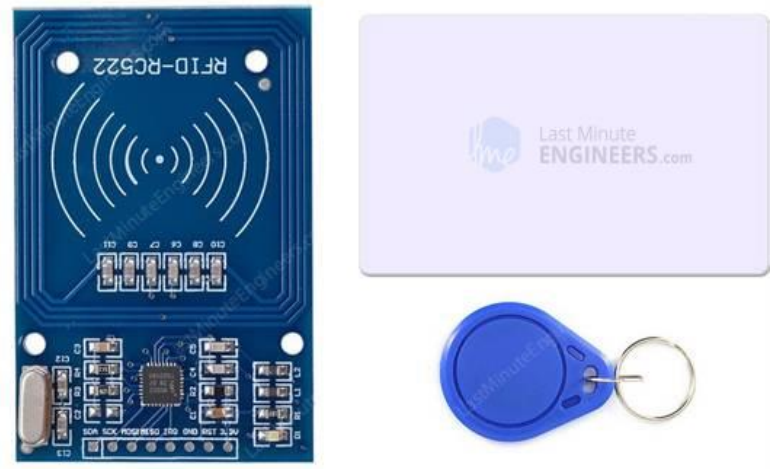
3.2.4 Description of Main Component

1. Arduino Uno R3

Arduino Uno R3 board, Arduino is an open-source physical computing application based on a basic I / O board and a programming framework that incorporates the Processing / Wiring language .The Arduino will be a

microcontroller for my project which will process the data from input and control the output, for example when the scanner got the information data will collect by Arduino and after that, it will send the pulse to the output such as make down the bar parking

2. Arduino RFID RC522 Card Reader



The RC522 is a 13.56MHz RFID module that is based on the MFRC522 controller from NXP semiconductors. The module can supports I2C, SPI and UART and normally is shipped with a RFID card and key fob. It is commonly used in attendance systems and other person/object identification applications.

The RC522 is a RF Module that consists of a RFID reader, RFID card and a key chain. The module operates 13.56MHz which is industrial (ISM) band and hence can be used without any license problem. The module operates at 3.3V typically and hence commonly used in 3.3V designs. It is normally used in application where certain person/object has to be identified with a unique ID.

3.2.4.1 Component 1

1. Buzzer

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.

3.2.4.2 Component 2

Ultrasonic sensor

An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves.

An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity.

3.2.4.3 Component 3

Adapter 12V

This 12V 2A Power Adapter is a high-quality power supply manufactured specifically for electronics. These are switch mode power supplies which means the output is regulated to 12V and the capable output current is much higher (2000mA).

3.2.4.4 Component 5

LED

The Bi-color LED is a handy little component that allows two colors (red and green) in a single LED while only having two pins (cathode and anode). The

color of the LED depends on the polarity of the connection, only allowing one color at a time. This LED can easily be applied to a circuit to visually indicate polarity direction. Or in my case it can save me an extra i/o pin on a forthcoming Arduino project.

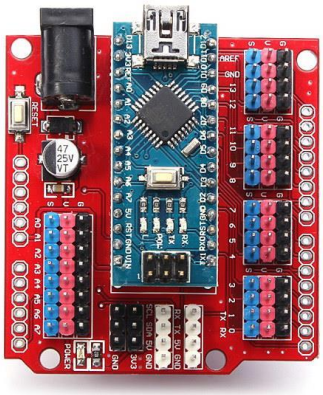
3.2.4.5 Component 6

Servo motor

A **servo motor** is a type of motor that can rotate with great precision. Normally this type of motor consists of a control circuit that provides feedback on the current position of the motor shaft, this feedback allows the servo motors to rotate with great precision. If motor is powered by a DC power supply then it is called DC servo motor, and if it is AC-powered motor then it is called AC servo motor.

3.2.4.6 Component 7

Arduino Nano/ Uno 5v



This Expansion Shield suitable for Arduino NANO /UNO.

- Beside the pin already lable the pinout for arduino board.

- More 5v and GND for sensor / Servo.
- Bluetooth / IIC Pinout
- DC Power Plug build in
- Reset button build in
- Easy to use, plug and play.

3.2.5 Circuit Operation

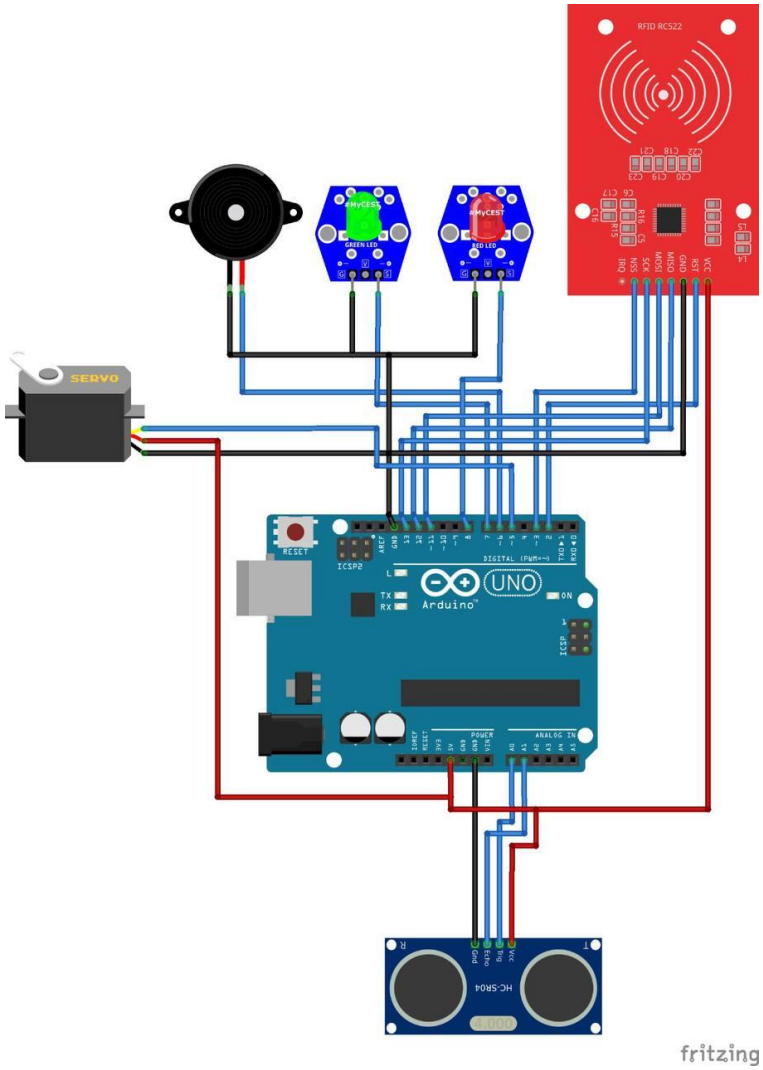
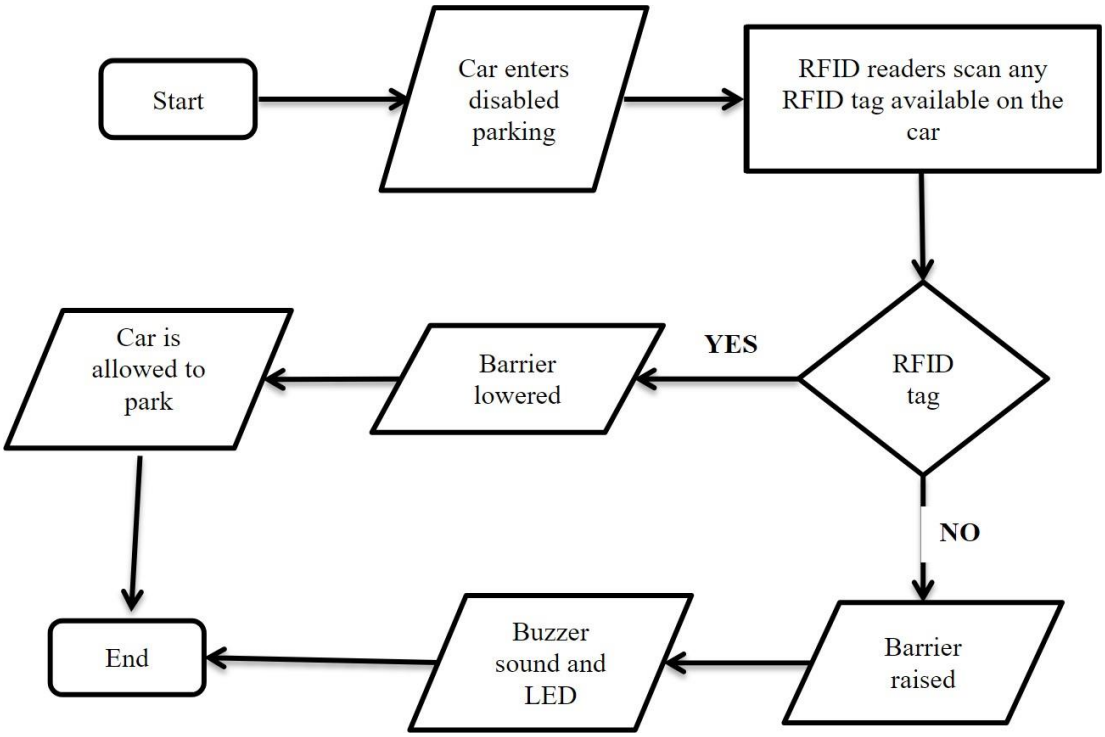


Figure 3:4 Circuit Operation

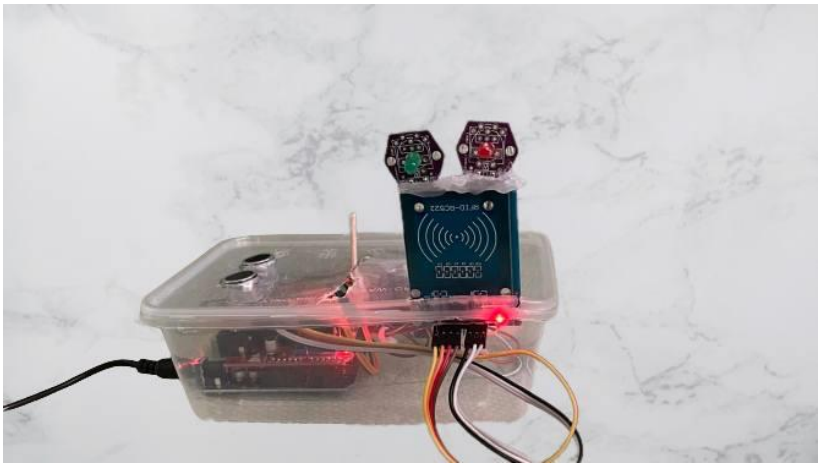
3.2.6 Flowchart of the System



3.2.7 Description of Flowchart

It is show that we have two way for flowchart. The first flowchart is for detect the car and reading the card. If we follow, we can see at flowchart that we must scan first the card that we have and the scanner will read the data in the card. If the reader detect the true information, then LED green will blinking and the barrier will come down. As for the second type of flowchart, we can see that if reader detect the wrong card than LED red will blinking and the buzzer will sound.

3.2.8 Mechanical Design/Product Layout



Error! Reference source not found. shows the design of the product

3.3 Sustainability Element in The Design Concept

The focus of this prototype is to avoid the irresponsible attitude of some parties who use parking for the disabled. This means that there are still people in our society who do not feel guilty about meeting other people's needs. Therefore, the existence of this prototype is intended to reduce attitudes that should not be emulated by future generations. Furthermore, this prototype also provides a barrier to prevent irresponsible users; this is very useful for people with disabilities because it can prevent their rights from being used at will.

3.4 Chapter Summary

The interface, client terminal and database server must all be completed as part of the project. These elements are being developed separately. In a closed-loop system, the Arduino serves as the main controller. Proteus software is used to build the controller circuit, which is then made into a PCB circuit. The Arduino oversees the data storage, card reading and barrier down during card scanning. Overall, this project includes several components, circuits and flowcharts that will be used to build a smart card system for smart card parking while incorporating sustainable and efficient design elements.

CHAPTER 4

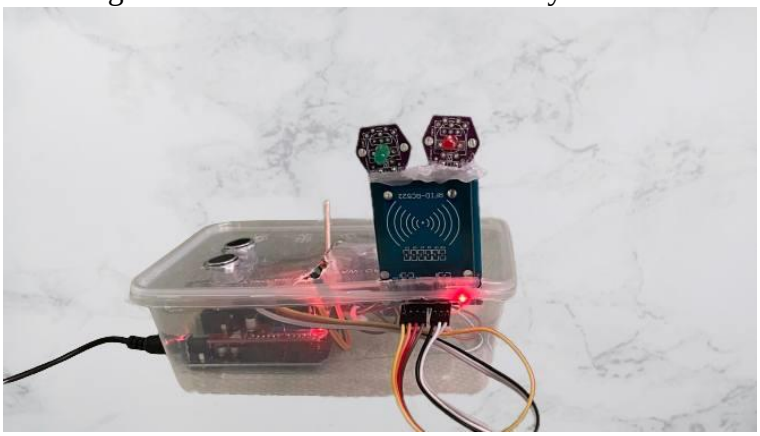
4 RESULTS AND DISCUSSION

4.1 Introduction

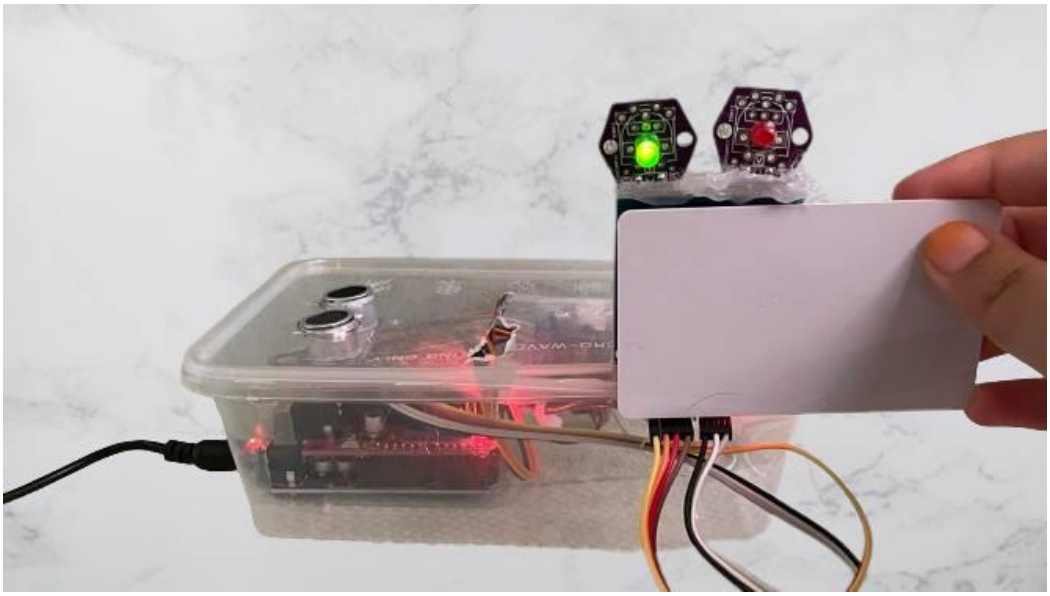
Financial resources for this project, most of the basic components and material used in this project are using our own money because we don’t have a sponsor. The cost projection is estimated at RM500. This cost is under the budget, and this is quite cheaper than the others project. The development cost is still feasible for six months. It is viable and achievable based on the investigation conducted.

4.2 Results and Analysis

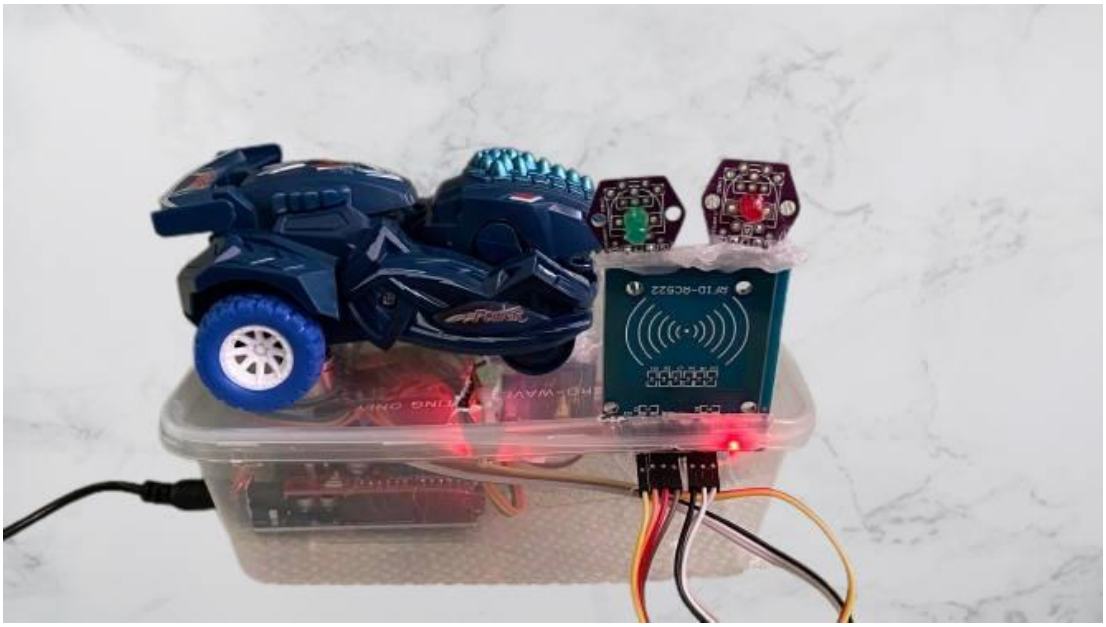
The below diagram shows the initial case of the system when we turn on our project



The below diagram shows the status of the parking zone when the auditor scan on the RFID reader using the correct card, the green LED will light up and the barrier will go down

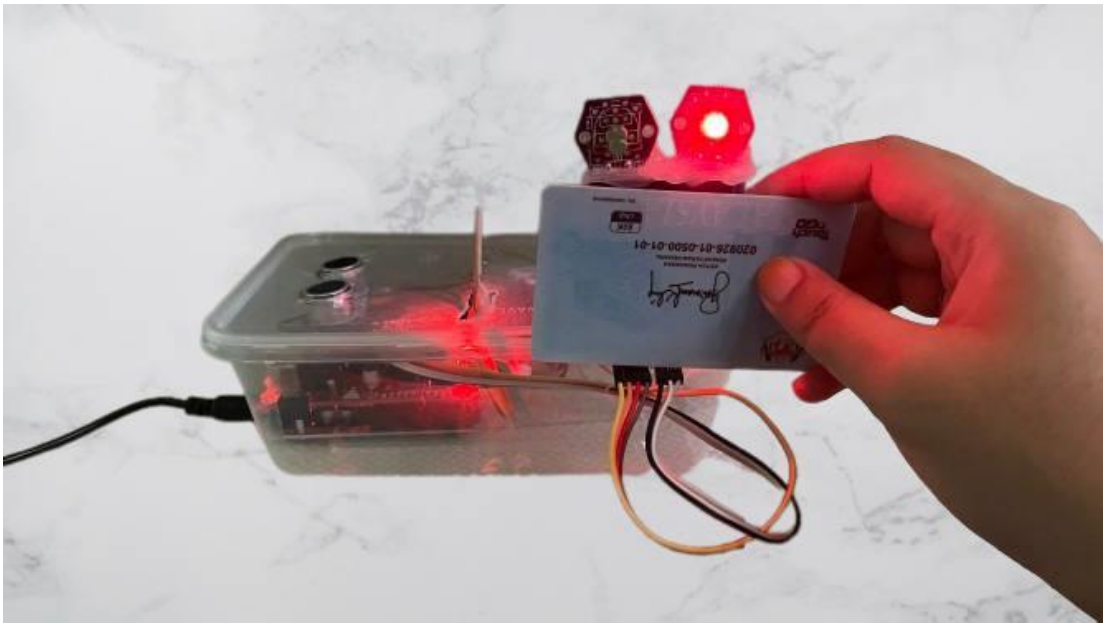


when the user has finished scanning and the green light has gone out, the user can use the parking lot



4.3 UNCORRECT CARD

The figure below shows the situation in which the user uses an incorrect card to scan at the RFID reader. The red led light will flash and the buzzer will sound. And what we can see that the barrier does not go down



4.4 Chapter Summary

Overall, the project's financial resources came from within the project's own budget, and the cost prediction was reasonable. Successful conception and execution of the system's interface and data structure.

CHAPTER 5

5 CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

As a result, this project is a success because it meets the four objectives indicated previously. Gradually, the author can now make the project as big as it can be, and the relevance of the topic to engineering prospects is becoming clear

5.2 Conclusion

At the end of this project, we hope that this project called parking oku using smart card will provide awareness and contribute benefits to all, especially for the disabled. This project can maintain better facilities for people with disabilities

5.3 Suggestion for Future Work

This is a small project for customers, especially for the "mall" or the government, to decide whether they want or not to participate in the installation of this project in the parking lot for the disabled. According to the search results here, the best suggestion for future projects is to implement this project so that we can both protect the rights of people with disabilities and avoid a lack of responsibility in our society.

5.4 Chapter Summary

This chapter concludes that this project is effective in achieving the objectives that were previously set. Because people with disabilities no longer need to waste their time looking for parking spaces provided for them if other able-bodied people have misused their parking spaces, Furthermore, with this smartcard

system, we can take care of facilities for people with disabilities more perfectly. Finally, the goal of reducing the use of manpower has been achieved because the supermarket custodian no longer needs to supervise the parking lot full-time from people who are not responsible for using the facility. This project highlights the potential of new technologies and solutions for addressing difficulties in disability care facilities while reducing irresponsibility in the future.

CHAPTER 6

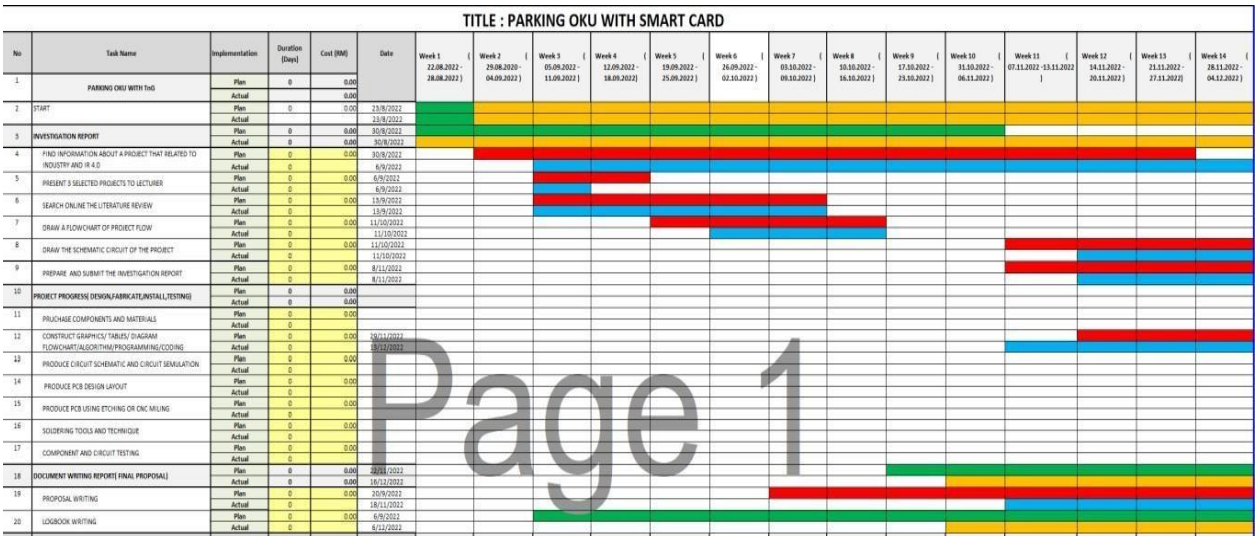
6 PROJECT MANAGEMENT AND COSTING

6.1 Introduction

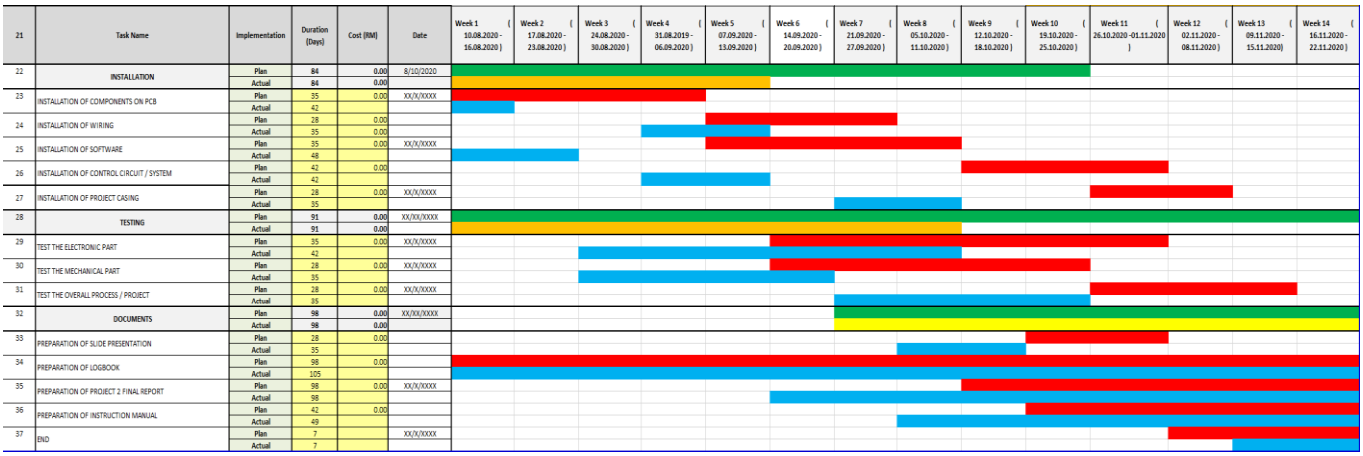
Financial resources for this project is most of basic components and material used inthis project basically using our own money because we totally don't got any sponsor. Based on the cost projection it is estimated at RM500, and it quite cheaper and under the budget. The development cost is still feasible for six months. It is viable and achievable based on the investigation conducted.

6.2 Gant Chart and Activities of the Project

Semester 4



Semester 5



21	Task Name	Implementation	Duration (Days)	Cost (RM)	Date
22	INSTALLATION	Plan	84	0.00	8/10/2020
		Actual	84	0.00	
23	INSTALLATION OF COMPONENTS ON PCB	Plan	35	0.00	XX/X/XXXX
		Actual	42		
24	INSTALLATION OF WIRING	Plan	28	0.00	
		Actual	35	0.00	
25	INSTALLATION OF SOFTWARE	Plan	35	0.00	XX/X/XXXX
		Actual	48		
26	INSTALLATION OF CONTROL CIRCUIT / SYSTEM	Plan	42	0.00	
		Actual	42		
27	INSTALLATION OF PROJECT CASING	Plan	28	0.00	XX/X/XXXX
		Actual	35		
28	TESTING	Plan	91	0.00	XX/XX/XXXX
		Actual	91	0.00	
29	TEST THE ELECTRONIC PART	Plan	35	0.00	XX/X/XXXX
		Actual	42		
30	TEST THE MECHANICAL PART	Plan	28	0.00	XX/X/XXXX
		Actual	35		
31	TEST THE OVERALL PROCESS / PROJECT	Plan	28	0.00	XX/X/XXXX
		Actual	35		
32	DOCUMENTS	Plan	98	0.00	XX/XX/XXXX
		Actual	98	0.00	
33	PREPARATION OF SLIDE PRESENTATION	Plan	28	0.00	
		Actual	35		
34	PREPARATION OF LOGBOOK	Plan	98	0.00	
		Actual	105		
35	PREPARATION OF PROJECT 2 FINAL REPORT	Plan	98	0.00	XX/X/XXXX
		Actual	98		
36	PREPARATION OF INSTRUCTION MANUAL	Plan	42	0.00	
		Actual	49		
37	END	Plan	7		XX/X/XXXX
		Actual	7		

Week 1 (10.08.2020 - 16.08.2020)	Week 2 (17.08.2020 - 23.08.2020)	Week 3 (24.08.2020 - 30.08.2020)	Week 4 (31.08.2019 - 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)

6.3 Cost and Budgeting

This project involves the cost of purchasing components and materialsthroughout its implementation. components involving cost are hardware. Most of these hardware are purchased through online purchase methods to make it easier as well as save on costs.

The overall gross budget estimate in the implementation of this project is RM 500 and other expenses is at RM 209.14 as shown in Table 1 According to this budget cost, this project is can be considered as a lesscostly project compared to other projects that can cost over a thousand ringgit. The cost of the project is also in line with one of the key features of a good project developer that is low cost but have a high quality project

NO	COMPONENTS AND MATERIALS	THE UNIT PRICE	QUANTITY	TOTAL
1	ARDUINO UNO	RM 42.90	1	RM42.90
2	ULTRSONIC	RM3.30	1	RM3.30
3	BUZZER	RM2.50	1	RM2.50
4	LED GREEN\RED	RM1.00	2	RM2.00
5	ADAPTER 12V	RM9.90	1	RM9.90
6	Servo motor	RM7.80	1	RM7.80
7	JUMPER WIRE FEMALE TO FEMALE	RM5.50	1 BUNDLE	RM5.50
8	RFID MODULE	RM8.90	1	RM8.90
9	Arduino uno nano 5v	RM11.90	1	RM11.90
10	Male power jack	RM5.00	1	RM5.00
11	Other materials	RM50	-	RM50
			TOTAL	RM149.70
List of other costing				
1	Transportation	RM50	-	RM50
2	Postage	RM20	-	RM20
3	Craft work		-	
			Total	RM70
			Overall total	RM219.70

6.4 Chapter Summary

The summary of this chapter is that the project is being funded using the team's own money as they do not have a sponsor. The estimated cost of the project is RM500, which is considered low compared to other projects. The team conducted a survey of online shops to compare prices before purchasing the necessary hardware components, which helped save time and costs. The overall budget estimate for the project is less than RM500, making it a low-cost project with a focus on high-quality development.

REFERENCES

7 References

Gining, R. A., Fauzi, S. S., Hadi, A. F., Razak, M. Z., & Jamaluddin, M. N. (2018). Design and Development of Disabled Parking System for Smart City. Journal of Physics: Conference Series, 1019, 012016. doi:10.1088/1742- 6596/1019/1/012016

Yousaf, K., Durairajah, V., & Gobee, S. (2016). SMART PARKINGSYSTEM USING VISION SYSTEM FOR DISABLE DRIVERS (OKU).

JAMARUDIN, A. Z., & Muslim, R. (2021). Proposed Design of Disabled Parking Management System using RFID Sensor Technology. Progress in Engineering Application and Technology, 2(1), 92-101.

Application Notes, "Introduction to RFID Technology" CAENRFID: The Art of Identification (2008). IJCSI International Journal of Computer Science Issues, Vol.7, Issue 1, No. 3, January 2010

Yan, G., Olariu, S., Weigle, M. C., & Abuelela, M. (2008). SmartParking: ASecure and Intelligent Parking System Using NOTICE. 2008 11th InternationalIEEE Conference on Intelligent Transportation Systems. doi:10.1109/itsc.2008.4732702

8 APPENDICES

APPENDIX A- PROGRAMMING

```
#include <SPI.h>
#include <MFRC522.h>
#define SS_PIN 3
#define RST_PIN 2
MFRC522 mfrc522(SS_PIN, RST_PIN);
#include <Servo.h>
Servo myservo;

int buzer = 6;
int green = 7;
int red = 8;

//-------------------------------------------------------------------

char Card1[]="91 80 78 1D";
char Card2[]="3A F5 A4 16";

//-------------------------------------------------------------------

int flag1 = 0;
int flag2 = 0;

//-------------------------------------------------------------

int plus = 0;
```

```
const int trigPin = A0;
const int echoPin = A1;

// defines variables
long duration;
int distance;

int angle_open = 0;
int angle_close = 90;



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

  SPI.begin();
  mfrc522.PCD_Init();

  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);

  myservo.attach(5);

  myservo.write(angle_close);

  pinMode(buzer,OUTPUT);
  pinMode(green,OUTPUT);
  pinMode(red,OUTPUT);
  digitalWrite(green,LOW);
  digitalWrite(red,LOW);
```

```
  digitalWrite(buzer,HIGH);
  delay(50);
  digitalWrite(buzer,LOW);
  delay(50);
  digitalWrite(buzer,HIGH);
  delay(50);
  digitalWrite(buzer,LOW);
  delay(3000);
}

void loop()
{
  ultrasonic_();
  if ( ! mfrc522.PICC_IsNewCardPresent())
  {
    return;
  }
  if ( ! mfrc522.PICC_ReadCardSerial())
  {
    return;
  }
  Serial.print("UID tag :");
  String content= "";
  byte letter;
  for (byte i = 0; i < mfrc522.uid.size; i++)
  {
     Serial.print(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " ");
     Serial.print(mfrc522.uid.uidByte[i], HEX);
     content.concat(String(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " "));
     content.concat(String(mfrc522.uid.uidByte[i], HEX));
  }
```

```
 Serial.println();
 Serial.print("Message : ");
 content.toUpperCase();

//--------------------------------------------------------------------------------


  if ((content.substring(1) == Card1)||(content.substring(1) == Card2) && (flag1 == 0))
 {
   Serial.println("RECORD");
   Serial.println();
   digitalWrite(green,HIGH);

   myservo.write(angle_open);

   buzzer();

   delay(2000);
   digitalWrite(green,LOW);
   flag1 = 1;
 }

 /* else if ((content.substring(1) == Card1) && (flag1 == 1))
 {
   Serial.println("RECORD");
   Serial.println();
   digitalWrite(green,HIGH);

   buzzer();
   delay(2000);
   digitalWrite(green,LOW);
```

```
   flag1 = 0;
  }*/

//--------------------------------------------------------------------------------

  else
  {
    digitalWrite(red,HIGH);
    digitalWrite(buzer,HIGH);
    delay(2000);
    digitalWrite(buzer,LOW);
    digitalWrite(red,LOW);
  }

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

void buzzer()
{
  digitalWrite(buzer,HIGH);
  delay(100);
  digitalWrite(buzer,LOW);
  delay(100);
  digitalWrite(buzer,HIGH);
  delay(100);
  digitalWrite(buzer,LOW);
}

void ultrasonic_()
{
  // Clears the trigPin
```

```
digitalWrite(trigPin, LOW);
delayMicroseconds(2);

// Sets the trigPin on HIGH state for 10 micro seconds
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);

// Reads the echoPin, returns the sound wave travel time in microseconds
duration = pulseIn(echoPin, HIGH);

// Calculating the distance
distance= duration*0.034/2;

// Prints the distance on the Serial Monitor
Serial.print("Distance: ");
Serial.println(distance);

if(distance < 10 && flag1 == 1)
{
  flag1 = 2;
  buzzer();
}
else if(distance > 15 && flag1 == 2)
{
  flag1 = 0;
  myservo.write(angle_close);
  digitalWrite(buzer,HIGH);
  delay(100);
  digitalWrite(buzer,LOW);
}
```