

POLITEKNIK

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Wireless Grass Cutter

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JABATAN KEJURUTERAAN ELEKTRIK

NOVEMBER 2022

WIRELESS GRASS CUTTER

NAME

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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

NOVEMBER 2022

CONFIRMATION OF THE PROJECT

The project report titled "Wireless Grass Cutter" has been submitted, reviewed and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

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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"

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DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : WIRELESS GRASS CUTTER

SESSION : SESI 1 2022/2023

1. I, **SARANYAA A/P NARAYANASAMY (08DEU20F2014)**

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(Hereinafter referred to as 'the Polytechnic').

2. I acknowledge that 'The Project above' and the intellectual property there in 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) **SARANYAA A/P NARAYANASAMY**
(Identification card No: - 020313070690)

.....

In front of me,

As a project supervisor, on the date:

PUAN NORHAYATI CHE HUSIN

)

)



ACKNOWLEDGEMENTS

I gave this project my best effort. It would not have been possible, though, without the kind support and cooperation of many people and organizations. I would like to sincerely thank each and every one of them. I owe PUAN HORHAYATI CHE HUSIN a debt of gratitude for their vision, constant supervision, and provision of the information necessary for the Project as well as their aid in seeing it through to completion.

I want to express my gratitude to my parents and the electrical engineering department staff for their wonderful support and cooperation in seeing my project through to completion. I want to express my deep gratitude to the professionals who took the time to listen to me so intently. My gratitude and appreciations also go out to my coworker who helped me build the Project and those who volunteered their skills in order to assist me.

My coworkers who helped me create the Project and others who gave their expertise to help me deserve my gratitude and appreciation as well.

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CHAPTER 1

1 INTRODUCTION

1.1 Introduction

When we are driving in the driveways or in the highways, we often see that some lawn carers will be cutting the grass in their lawns or the side of the road. Here we can see that the people cuts the grass in the high heat due to the global warming and in the unpredictable whether that is occurring now. Sometimes the people will hesitate to cut the grass in such whether. So my project here, which is a wireless grass cutter, which uses a remote to control the machine, will do a huge favour to the people by not forcing themselves to go out in the heat whether to exhaust them , whereas the people can just stay in the house and control the machine to cut the grass

1.2 Background Research

Consumers are looking for solutions to reduce their personal carbon footprints in an era where technology and environmental awareness are blending. Man-made pollution affects our daily lives and, more specifically, our homes. By developing a wire-free lawn cutter, this physically taxing and time-consuming operation is eliminated for the user. The proposed concept makes lawn mowing possible for people with physical limitations who would otherwise be unable to do so. The wireless lawn cutter gives the user more free time even without a physical restriction. This independence is offered in a platform that requires little user engagement and is worry-free. Business owners with relatively small grassy grounds that require weekly mowing are another consumer base in need of this product. Currently, they pay a sizable quantity of money to have a modest amount of grass cut. This device can also be advertised to tech-savvy consumers who prefer to operate a lawnmower remotely.

1.3 Problem Statement

Normal grass cutter drains human's energy and time. The workers and the public literally have to stand in the heat and rain to cut the grass. People have to have make time to just cut the grass. Plus, it makes sound pollution which is not good for the environment. Moreover, sometimes manual grass cutter do not cut the grass accordingly meaning sometimes it will be short and it will be long. My project will make the peoples life much better because my projects runs with a remote that is controlled by the people themselves. The workers can stay under a shade or the people can just stay in the house while controlling the machine where they want the

grass to be cut. Time will be saved so does the peoples energy. My project is also soundproof. Which means it does not make so much sound as the normal wired grass cutter. The sound pollution would be less. My project will be produced in a perfect height to cut the grass evenly. It does not make any slag where it will be evenly cut. Moreover, when the workers cut the grass in the public the stone will hit some cars, windows, and even it will hit the people. That actually brings damage. So, my product is environmental friendly which does not make any bad impact on other people or objects. By using my project people especially people who lives in a teres house or double story will be satisfied with this because it actually helps them in a lot of ways. Not only the residents but also the workers that appointed to cut the grass. My project does not affect their work. They will be still appointed to work but more in a unique way.

1.4 Research Objectives

Automatic grass cutter will give more time to ourselves. We can operate the machine using the remote while we can do other things at the same time. For an example, we can be on call with someone while controlling the machine using the remote. As for the workers, they do not have to carry the machine on their back or carry blades with them every time they lawn. They can just control where they want the cut wants to be cut and save their energy. My project also does not make any sounds meaning it will not make any sound pollution. It is soundproof that it is environmental-friendly. Children or even the adults do not have to shut their ears off while walking past when there is grass is being cut. My project will only make a good impact on the environment and to the public too. My project also much safer than the manual grass cutter because manual can cause some minor injuries to our skin. It is also a low maintenance machine.

1.5 Scope of Research

The scope of this project is to help the people that works in the heat with the manual grass cutter. It is to save the time, money and energy of the people. This project is also to help the environment from sound pollution and preventing the people from getting minor injuries. Not only the people but also the properties such as cars, motorcycles. This project will take up around 7 months in total to finish build it. The estimated cost that has to spend each month is RM 75.00. The hardware resources are available online and could purchase it there.

1.6 Chapter Summary

An overview of the project, which uses a wireless grass cutter, can be found in this chapter. I then create the problem statement, project objective, and project scope for this project after conducting background research.

CHAPTER 2

2 LITERATURE REVIEW

2.1 Introduction

Today's engineers and engineering students often research the project. They now have a greater understanding of and interest in the system, which is why. They believe that the advancement of technology and the future comfort of human life depend on the success of this endeavour.

2.2 Table of 4 Journal

NO	TITLE/AUTHOR	OBJECTIVE	METHOD	RESULT
1	<ul style="list-style-type: none">➤ Solar based wireless grass cutter➤ Vicky Jain, Sagar Patil, Prashant Bagane, Prof. Ms. S. SPatil	an autonomous grass cutter that will allow the user to the ability to cut their grass with minimal effort.	will comprise direct current (D.C) motor, a rechargeable battery, solar panel, a stainless steel blade and control switch.	This system is having facility of charging the batteries while the solar powered grass cutter is in motion. So it is much more suitable for grass cutting also. The same thing can be operated in night time also, as there is a facility to charge these batteries in day light. The DC motor is

				operated in low power with high efficiency. The battery is charged by the solar panel in a constant voltage. We met all the requirements and completed our goals for this project. This project eliminated the physical power required in pushing the mower without sacrificing safety.
2	<p>➤ Solar Grass Cutter</p> <p>➤ Sharda Associates</p>	<p>Because of the rising expense of gasoline and the impact of gas emissions from burned fuel into the environment, it became necessary to utilise the sun's plentiful solar energy as a source of power to run a lawnmower. Based on the main idea of mowing, a solar-powered lawnmower was created and built.</p>	<p>A direct current (D.C) motor, a rechargeable battery, a solar panel, a stainless steel blade, and a control switch make up the solar lawnmower. The stainless steel blade, which is directly linked to the shaft of the D.C motor, is driven by the D.C motor, which provides the requisite torque.</p>	<p>The solar lawnmower is controlled by a switch on the board that shuts the circuit and enables electricity to pass to the motor, which then drives the mowing blade. The solar charging controller recharges the battery. Different varieties of grasses were used to test the performance</p>

				of the produced equipment. The sun offers a steady supply of energy that is utilised for a variety of functions on Earth, including the atmospheric system.
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3.	<p>➤ Hybrid Operating Grass Cutter</p> <p>➤ Prof. Vinay M. Murgod , Aditya S. Rajmani , Appaji N. Gaonkar , Ajay Darak, Akshay Joshi</p>	<p>the project is to design the hybrid powered grass cutter which operates upon solar energy and avoids the drawback of old grass cutters. The purpose is to avoid fuel consumption and reduce the human effort, operating cost and maintenance cost. Also solar based grass cutters are environmental friendly it is used for various applications. The whole machine operates on the solar energy which is stored in battery.</p>	<p>The designed solar powered lawnmower comprises of direct current (D.C) motor, a rechargeable battery, solar panel, a stainless steel blade and control switch. Mowing is achieved by the D.C motor which provides the required torque needed to drive the stainless steel blade which is directly coupled to the shaft of the motor.</p>	<p>hybrid operational grass cutter will meet the challenge of environmental production and low cost of operation since there is no cost for fuelling. A hybrid operational grass cutter has been developed for the use of residences and establishments that have lawns where tractor driven mowers could not be used. The machines capacity is adequate for its purpose. The device combines the mower and trimmer in a single set up to</p>
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				<p>reduce the operational costs and efforts of using the mower and trimmer separately. Also it can be operated on both DC and AC current. The machine has proved to be a possible replacement for the gasoline powered lawn mowers.</p>
4.	<p>➤ Design and Fabrication of Grass Cutter ➤ Sachin Thorat</p>	<p>This machine can be called as grass cutter. Depending on its variants it can be termed differently like solar powered battery powered etc. In its simple construction a very <u>high speed motor</u> is connected to an end of a holding rod that is hang with a shoulder and held with hand to the free end of this rod a battery pack is</p>	<p>motor is working using with the help of electric power supply; on the motor shaft we have fixing the arrangement of rotating disc. The rotating disc arrangements are running like a cam. The cutters are fixed on the top of the ram arrangements. When we switch ON the machine the motor start to rotate the</p>	<p>The cutter used is actually a flexible wire that cuts the grass with high speed rotation. The high speed rotation of the blades along with the centrifugal force acted on it due to its minimal weight enable the flexible plastic wires cut the grass easily despite being not any hard</p>

		<p>attached. Also a solar panel can be attached to charge the batteries there by making the grass cutter run with the help of solar energy.</p>	<p>cam arrangements which is shown in the figure. Here the rotary motion is converted in to the linear motion by using simple mechanisms. The linear motion ram is connected to the cutters as shown in fig, so that the cutter moves upward and downward direction the cutting process is carrying out through this machine</p>	<p>and sharp material which is generally associated with any cutting blades.</p>
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2.3 Chapter Summary

This chapter discusses the literature reviews of five journals that I discovered to be relevant to this study. Two of them are based on solar, one is on hybrid and the other one is about fabrication and design.

CHAPTER 3

3 RESEARCH METHODOLOGY

3.1 Introduction

In order to turn this project into a finished good with safety features, a highly detailed plan is being carried out. A step-by-step procedure is used to make sure the Project is completed on schedule. To do this, information must be gathered from a sample wireless grass cutter.

3.2 Project Design and Overview.

The circuit for this wireless grass cutter is relatively straightforward and consists of an Arduino Uno (CH340), which manages every aspect of the project, as well as a RF Remote, RF Receiver and etc. The entire process is managed by an Arduino Uno (CH 340). The remote is the main in controlling the machine. Through the remote the RF Receiver will detect the instruction and will operate the machine. The process is the Arduino Uno (CH 340) will absorb the information coming through and will work on the work it has to do which is cutting the grass where the remote will control the movements. The motor driver which has a left motor and right motor will cut the grass accordingly where the owner wants the grass to be cut.

3.2.1 Block Diagram of the Project

Figure 3.1 shows the block diagram of the whole system. It is shown that

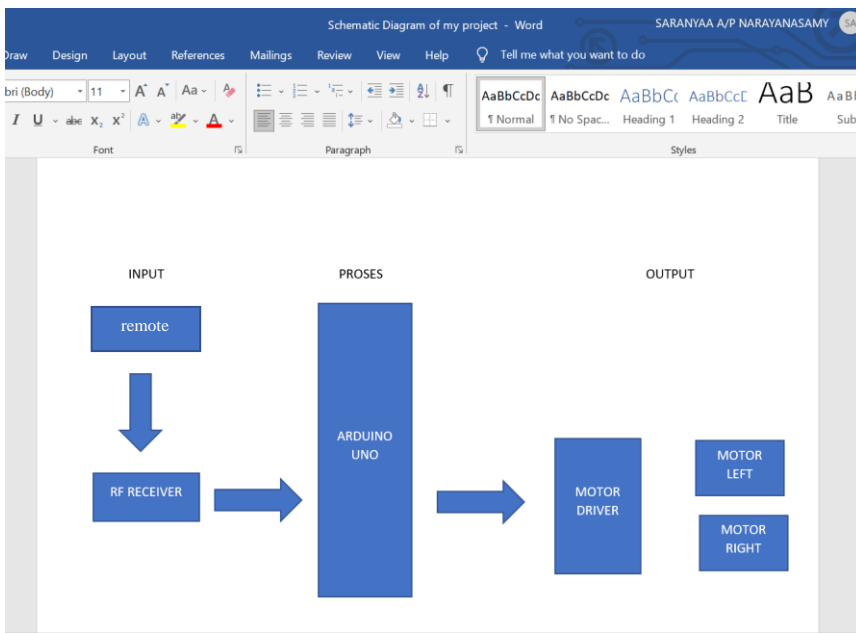


Figure 3.1: Block diagram of operation of the system

3.3 Project Hardware

As mentioned in the chapter above, the controller was designed using an Arduino Uno (CH 340) . This controller sensors a sensor from the machine, reports the results, and manages RF Receiver and the entire project's workflow. The entire process is managed by an Arduino Uno (CH 340).

3.3.1 Schematic Circuit

the overall circuit diagram of this Project:

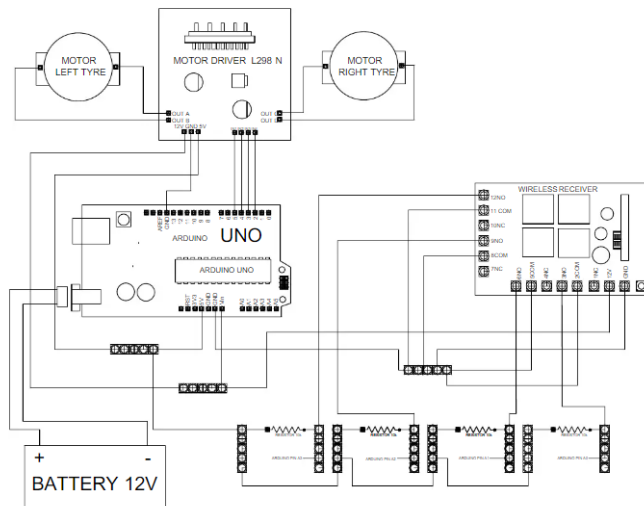


Figure 3.2: Circuit Diagram

3.3.2 Description of Main Component



20 Ways Male-Male Jumper cable (20cm)

This is very handy 40-way male to male, 20 cm length of rainbow jumper wires. You will need it for making wire harnesses or jumpering between headers on PCB's.



20 Ways Female-Female Jumper cable (20cm)

This is very handy 40-way female to female, 20 cm length of rainbow jumper wires. You will need it for making wire harnesses or jumpering between headers on PCB's.



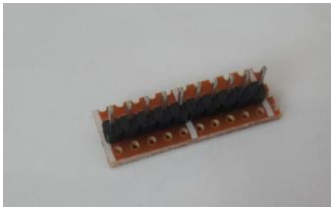
20 Ways Female-Female Jumper cable (20cm)

This is very handy 40-way female to female, 20 cm length of rainbow jumper wires. You will need it for making wire harnesses or jumpering between headers on PCB's



Arduino Uno (CH340) – Arduino Compatible

CH340 is a series of specialized chips designed to do only one task — being a USB-to-serial converter. Because of that high specialization it is much simpler and therefore cheaper, than powerful and versatile ATmega16U2 used in official boards.



Extender -5Pieces Per Pack

To Simplify cable connection at one node.



Resistor 10kohm-5Pieces Per Pack

A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.



4 Channel Wireless RF Remote

4-CH RF remote control is used to turn ON / OFF four different devices independently. Any of the four outputs can be configured to work independently in either toggle or momentary mode.



4 Channel Wireless RF Receiver

This board which operates at 433 MHz frequency range is a remote control relay board that can be used in various electronic and robotic boards, systems which requires remote control and again systems which can be operated remotely.

Arduino Power Jack



Power jack (Barrel connector) Supplying power via the barrel connector is one of the ways in which we can switch on the Arduino Uno . It is a circular port, 2.1mm in diameter.

Motor Driver Module (L298N)

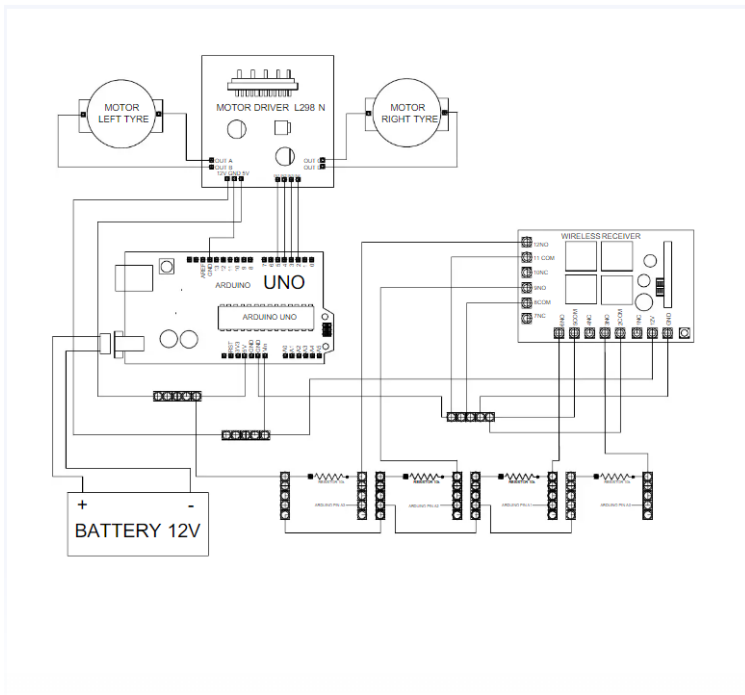
This driver module is based on L298N H-bridge, a high current, high voltage dual full bridge driver. It can drive up to 2 DC motors up to 2Amp each, or drive one stepper motor or 2 solenoids



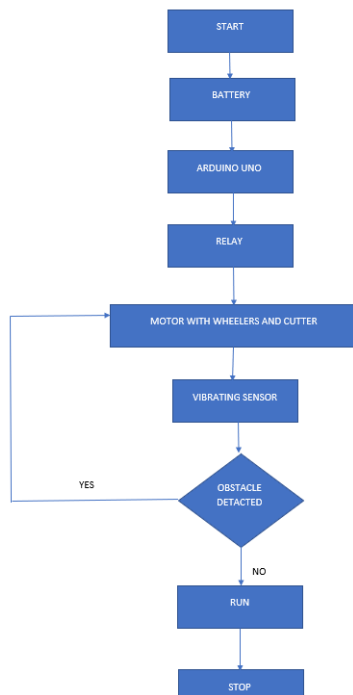
JGB37-3530 12v DC 12rpm High Torque Metal Gear DC Moto

This DC electric motor, made of high quality material, have good reliability. Great replacement for the rusty or damaged DC geared motor on the machine. Used for automatic window curtain, safe box, robot, optic equipment, electronic game machine, etc.

3.3.3 Circuit Operation



3.4 Flowchart of the System



3.4.1 Description of Flowchart

I've shown the procedure for this project in the flowchart above. First the battery has been fixed into the machine. Then the coding will be detected by the Arduino uno and following by the relay electrical component. After detecting it the wheelers and the cutter will begun start its work on cutting the grass with the help of vibrating sensor. If the obstacle has been detected which is the grass, the machine will continue do to its work. But if it does not then the machine will stop running and we have to detect the problem and solve the problem.

3.5 Chapter Summary

This chapter discusses the research approach for the project. In this research technique, I've incorporated the block diagram, project description, hardware, circuit diagram, component description, circuit operation, project flowchart, and flowchart description.

CHAPTER 4

4 RESULTS AND DISCUSSION

4.1 Introduction

This chapter examines the findings from the components from the system that we build and testing it. Additionally, the quantitative findings of the project's research were also examined, along with the qualitative data, the questionnaire's creation, and the results. In order to identify similarities, variable changes in the project, and differences between this study and prior studies and literature, the findings are also discussed in the context of prior research findings and the literature. Analyzing the data gathered is important to effectively finish this study, test the hypothesis, and respond to the research questions. Data is analysed using various chart types as was already mentioned in the chapter before.

4.2 RESULTS AND ANALYSIS

The research paper's results section should make an effort to summarise the findings without making any attempts to analyse or assess them. It should also act as a guide for the discussion part. When the results are announced, the analysis will make the public helpful. The author describes how the data from the analysis section was used. It is evident that the prototype we created functions flawlessly and unquestionably met our expectations. The technique can be made more effective, people may use the product without risk, and there is a lower likelihood of human error. Once the consumer on the plug they should be able to move the machine around. With just a click of the control the consumer will be able to function the machine.

4.3 DISCUSSION

The scope of work often addresses project requirements and details how specific project tasks will help achieve the project's objectives. Usually, this section will include an overview of the work that was did on the project. I did a schedule so that I can divide the work that has to be done accordingly without any delay.

Commented [FAP1]: This chapter contains the interpretation of the results and the analysis of data. The findings of the research should be compared and contrasted with those of previous studies presented in the literature review

4.4 CHAPTER SUMMARY

To summarise this chapter section, a straightforward explanation sequence has been developed. First and foremost, once after I completed the system as in use the control of the machine to move it around. A project's utility or flaws must be tested in order to be identified. The project's next stage once the test was finished was to produce a result, analysis, and discussion to satisfy its characteristic. With the test results in hand, it is possible to analyse the general state of the project. The operational characteristics and work ethic of the total project can then be simply explained in a concluding discussion.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The culmination of Project 1 is the focus of Chapter 5. In order to build a "Wireless Grass Cutter," this chapter will outline our accomplishments and goals. With a specific objective in mind, the "Wireless Grass Cutter" to let the consumers to save their time and energy without moving a cell in their body where my project will do all the works. With Wireless Grass Cutter for decrease human error, we can understand how significantly the work that being done has changed.

5.2 CONCLUSION

The project can be transformed into a more fascinating one that can be embraced by other consumers that will be helpful in the future. This will make everyone's work easier if we bring this product in the market . As a result, they would not have hard time to find a time to do the lawn and waste their energy. As a result, the efficiency of our project is more heavily weighted toward its usability, robustness, and sustainability. Not only does the user find the project easy to use, but it also lasts a long time without endangering the user or others.

5.3 FUTURE RECOMMENDATIONS

Since its giving a good impact to the public , it also benefits the consumers by making their work easier so that they don't have be worry about the time they need to find to clean the lawn , it will make them easier to do the work whenever they want by just flicking the control.

5.4 CHAPTER SUMMARY

When all of the project's work has been finished, a final conclusion must be produced in order to assess the project's overall progress. A project's completion might also demonstrate if its intended goal or scope was accomplished. Following the conclusion section, a project performance review is required to identify any possible weak spots. If there is, a more forceful recommendation to stop it will emerge. Future projects will be improved as a byproduct, which is a bonus. These findings and suggestions are crucial to us and our work since they will promote originality and creativity while also advancing society as a whole. I have put a lot of effort and excitement into this project, thus our hypothesis or objectives are also simple to locate. We need to understand why we are taking this step and promote education and innovation if we want to increase the legitimacy of the nation in the future.

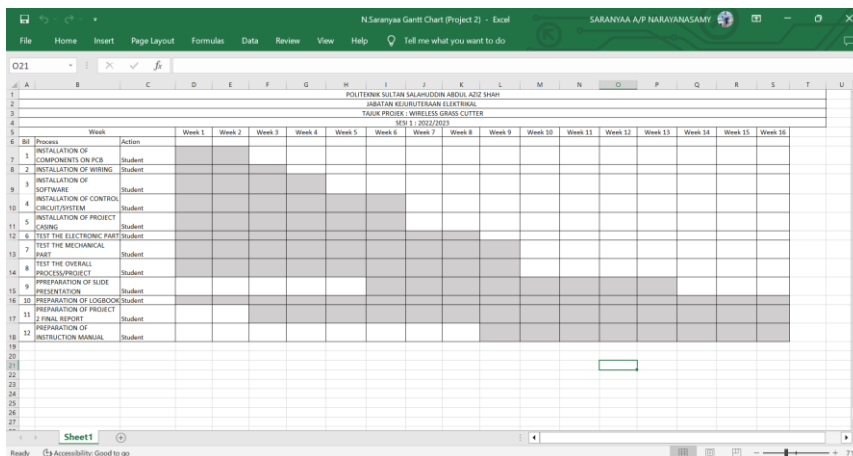
CHAPTER 6

PROJECT MANAGEMENT AND COSTING

6.1 Introduction

We had to spend our own funds to purchase the majority of the project's necessary parts and supplies because we don't have a sponsor. The cost is anticipated to be RM 507.00. Its cost is considerably less than the budget when compared to the other projects. For the ensuing six months, the development costs are still within reach. According to the research, it is feasible and realistic.

6.2 Gant Chart and Activities of the Project



6.3 Cost and Budgeting

In order to complete this project, it will be necessary to purchase supplies and parts. The Arduino Uno (CH 340) set, jumper wire, motor driver, extender, resistor, RF motor, RF receiver, Power Jack, and motor 12VDC 12RPM are some of the parts that are expensive. All of these parts are bought online to streamline the process and reduce costs. The total gross budget estimate for carrying out this project is RM 543.45, while additional costs come to RM 250.00. This project can be comparable to other projects that can cost

over a thousand ringgit in terms of cost, however according to the budget cost, it is less expensive. The cost of the project is also in line with one of the fundamental characteristics of an adept project developer, which is having a low cost but higher quality project.

No.	Component and materials	The unit price	Quantity	Total
1	Arduino Uno (CH 340) set	RM 36.00	1	RM 36.00
2	Jumper cable	RM 5.00	3	RM 15.00
3	Motor driver	RM 14.00	1	RM 14.00
4	Extender	RM 5.00	1	RM 5.00
5	Resistor	RM 1.00	4	RM 4.00
6	RF Remote	RM 15.00	1	RM 15.00
7	RF Receiver	RM 40.00	1	RM 40
8	Power Jack	RM 3.00	1	RM 3.00
9	Motor 12VDC 12RPM	RM 60.00	2	RM 120
			Total :	RM 252.00
	List of other costing			
1	Transportation	RM 15.00		
2	Postage	-		
3	Craft Work	RM 150.00		
4	Internet	RM 90.00		
5	Application	-		
			Total :	RM255.00
			Overall total	RM507.00

6.4 Chapter Summary

Both project management and costing have been discussed in this chapter. The project's operations are shown, along with a gantt chart. The cost and budget list for the project is also provided, along with a breakdown of the amount and the number of components.

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