



**SULTAN SALAHUDDIN ABDUL AZIZ SHAH
FINAL YEAR PROJECT REPORT**

AGROBOT

MECHANICAL ENGINEERING DEPARTMENT

DATE: 04 MEI 2023

CLASS: DKM5A

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I

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**Laporan ini dikemukakan kepada Jabatan Kejuruteraan Mekanikal
sebagai memenuhi sebahagian syarat penganugerahan Diploma
Kejuruteraan Mekanikal**

JABATAN KEJURUTERAAN MEKANIKAL

MEI 2023

II

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1. MUHAMMAD AKMAL BIN MD RADZI
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adalah pelajar tahun akhir Diploma Kejuruteraan Mekanikal,

Jabatan Kejuruteraan Mekanikal, Politeknik Sultan Salahuddin Abdul Aziz Shah, yang beralamat di Shah Alam 40150 Selangor.

2. Kami mengakui bahawa AGROBOT dan harta intelek yang ada didalamnya adalah hasil karya/ reka cipta asli kami tanpa mengambil atau meniru mana-mana harta intelek daripada pihak lain.
3. Kami bersetuju melepaskan pemilikan harta intelek AGROBOT kepada Politeknik Sultan Salahuddin Abdul Aziz Shah bagi memenuhi keperluan untuk penganugerahan Diploma Kejuruteraan Mekanikal kepada kami.

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Di hadapan saya AMALINA KAMILAH BINTI IBRAHIM

AMALINA KAMILAH BINTI IBRAHIM sebagai penyelia projek pada tarikh:

III

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Also, thank you to the team members for working together to make this proposal success. Without your support and encouragement we would not have been able to perform this task as perfectly as our other friends. In addition, many thanks also to our colleagues who worked hard to produce this work and also exchanged ideas to help us complete the course work. Finally, we hope that the work we do will increase our knowledge base and make us more cooperative and responsible.

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ABSTRACT

This project is an agrobot. It is a lawn mower that uses IoT technology and also only uses electricity. This machine has blocks and wheels, in which there are blades that will serve as lawn mowers. For the convenience of the user, we also installed an Arduino ESP8266 this allows agrobot to be controlled from just the tip of your phone. The AGROBOT is an electric grass cutting robot powered by a motor and battery. It has blades that function as lawn mowers. The project team successfully developed a way to control the AGROBOT using a phone through IoT technology, specifically an Arduino (esp8266) and an application called Blynk IoT. This enables users to control the AGROBOT remotely from anywhere with an internet connection. The innovation of a smart robot grass cutter controlled by a phone makes it convenient for lawn owners, including housewives and smallholders. This showcases the potential of IoT in various agricultural products. One of the problems is the existing machine of lawn mower its generator motor which takes a long time to turn on and using a fuel. Next, the objective of this research is to create an electric IoT lawn mower with improve the machine without use fuel. The study of methodology is careful planning throughout this semester. To facilitate the implementation of the final project, the methodology must be set as best as possible. Based on the research findings, it can ease a human burden.. Finally, the suggestion is that every innovation we make must have its own approach and benefits, so our idea to create Agrobot is a good idea.

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CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

A lawn mower (also named as mower, grass cutter or lawnmower) is a machine utilizing one or more revolving blades to cut a grass surface to an even height. The height of the cut grass may be fixed by the design of the mower, but generally is adjustable by the operator, typically by a single master lever, or by a lever or nut and bolt on each of the machine's wheels. The blades may be powered by manual force, with wheels mechanically connected to the cutting blades so that when the mower is pushed forward, the blades spin, or the machine may have a battery-powered or plug-in electric motor. The most common self-contained power source for lawn mowers is a small (typically one cylinder) internal combustion engine. Smaller mowers often lack any form of propulsion, requiring human power to move over a surface; "walk-behind" mowers are self-propelled, requiring a human only to walk behind and guide them. Larger lawn mowers are usually either self-propelled "walk-behind" types, or more often, are "ride-on" mowers, equipped so the operator can ride on the mower and control it. A robotic lawn mower ("lawn-mowing bot", "mowbot", etc.) is designed to operate either entirely on its own, or less commonly by an operator by remote control. But what we are planning right now is to make an iot grass cutter/Lawn mower that can just be controlled by just using a phone.

In the past and even until now, cutting of grasses in the schools, sports tracks, fields, industries, hotels, public center, etc. Was done with a cutlass. Although this method is manual cutting but it have a lot of benefits. Also accuracy in cutting level was observed using the manual cutting method. This work deals with the cutting of verdant (shrubs, grass, flowers, leaves of trees) and also with the design of the machine, its efficiency, rigidity, mode of operation and the selection of materials. The design gives a greater degree of flexible mobility and interchangeability. The aim of this work includes, but not limited to the following term. Example to reduce cost of cutting and also to beautify the environment.

The presence of this grass machine can help ease the burden of humans .So we are planning and decide to create a more effective and efficient lawn mower that uses IOT technology which is agrobot for use in the appropriate place. This AGROBOT comes with a blade that can cut the grass evenly. Nor does it use any fuel to turn it on. So in this way it can save costs. Next, we also planning to upgrade this AGROBOT in a safety way.

1.2 PROBLEM STATEMENT

The lawn machine we use today is an automatic lawn mower that makes it easy for humans. But there are still some disadvantages to the lawn. Some of the auto lawn mowers that use the motor will cause difficulty in starting the engine. It also takes a long time to turn on or start. So this problem will be affect to lawn mower user to use it because it will waste time. We have planning to create an agrobot that only uses electric.

Besides, the problem we have when using the lawn is the lawn mower we use today will produce noise. This is a little bit interfere with other people's hearing. It can also be categorized as sound pollution. So by using an Agrobot it will not produce noise that will disturb the hearing of others. In addition, air pollution problems will also occur if we use a lawn mower that uses the engine. So we can solve this problem with an Agrobot that only uses the battery to rotate the motor for the blade.

Then, another problem is the lawn mowers nowadays mostly use fuel. A costs for having a lawn mower using fuel is a bit expensive compared to ordinary lawn mowers. So, here we can reduce the cost because the Agrobot does not use any fuel and it can save your money. This is because, not everyone is able to have a lawn mower using the engine. This is one of the factors we want to create An Agrobot to help less fortune.

1.3 OBJECTIVE PROJECT

The objective to this research are:

- To make use of IOT technology in our project which is by using Arduino ESP8266.
- To create a convenient product for agriculture

1.4 RESEARCH QUESTIONS

This study will answer the following research questions:

- What is the advantage of an Agrobot?
- Does this Agrobot reduce your costs compared to a normal lawn mower?
- Is it easy for us to use Agrobot? (Using a phone)

1.5 SCOPE OF PROJECT

Have you ever thought about what to expect from your backyard besides a beautiful place to chill? The answer to that is the healthier body. If you think this statement is heading to the suggestion that you do the grass-cutting and grass-picking manually under the intense exposure of sunlight to get that healthier body, you are partially wrong.

Yes, it is suggested that you soak in the sunlight to help you sweat more. But, doing all the yard-care activities can be frustrating, and it will drain your energy in no time. Using the lawn mower, however, will change the rest of the scenario as you no longer have to do all the hard works. You still get the chance to move your body in a way that it does not force your body.

The scope and limits to this research are:

- i. This Agrobot can operated by using an application that is called blynk IOT on Iphone or Android**
- ii. Lawn mowers are only suitable for home area which has 30x20 square fit.**
- iii. This Agrobot is suitable used by housewives to do house chores.**
- iv. This Agrobot also can used by gardener which have a small garden at house.**
- v. We also used high quality stainless steel blade to ensure every cuts neat and evenly.**

1.6 SIGNIFICANCES OF PROJECT

Every innovation we create must have its own approach and benefits, so our idea of applying IOT Technology on a lawn mower is a good idea. To make cutting grass easier by just using a phone. We also aim to create a convenient product for agriculture. It also can help the underprivileged because the price are affordable and also give benefits to consumer.

1.6 CHAPTER SUMMARY

In this chapter, the studies was explained about its origin of ideas and inspirations. All the stated objectives can be achieved through problem statement. Thus, with this Agrobot we can create an innovation that give benefits to everyone. This Agrobot is not only useful for lawn mower user but housewives also can use it as well. This is because this is because agrobot does not require a lot of energy to operate it. Next, the scope of this project explains about this Agrobot operator and the extent of the suitable area for this machine.

The conclusion is, this Agrobot can give a good impact to the agriculture community and advantages to the users.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Literature means research articles that are referred to understand and study the research issues. The literature review is used to provide contextual studies by looking at the research that has been conducted in the field of research and not just summarizing the research conducted by other researchers.

In addition, through the study of the literature the researcher can also identify the weaknesses and strengths of the resulting project. Therefore, the literature review is important as it can be used from several aspects as a guide and reference for the researcher in completing this study. The contents of this chapter may contain a brief introduction to the subject of the study, concept or article related to, previous studies related to the field of study and summary of this chapter. The general topic of the issue or area of interest needs to be identified and then provide the appropriate context for the literature review.

In the year 1830, the first Lawn Mower was invented by the English engineer Edward Budding. He first thought of the idea after he saw a machine in a local cloth mill. Budding realized how the same mechanism that was being used to trim cloth to give it a smooth finish after weaving could be used for cutting grass as well. Early 1900s Steam Lawn Mowers which used light weight petrol engine or steam power units appeared on the scene in the 1890s. While steam mowers worked great, by the early 1900s, the petrol powered lawn mowers won over the market. But now, our project will make a best lawn mower which is more to easy use a housewife to do house chorus.


This chapter contains the different types of materials to meet the necessary features of this project. As stated this project needs to meet the objective features in order to solve the problem. It will also state the materials selected for the project. Each material we choose is the best and meets the requirements.


2.2 TYPE OF LAWN MOWER

There are basically two different lawn mower types: reel mowers and rotary mowers. Reel mowers make precise clean cuts on grass blades using the scissor-like action of a cylinder of rotating blades. They may have 2-6 of these rolling blades which are usually turned by the axle of the mower's wheels. Available as tow behind attachments for lawn tractors, gas or electric powdered or manual push models, reel mowers are generally less noisy and create less pollution than rotary mowers. Reel mowers can also cut grass to short heights better than rotary mowers. However, reel mower blades can be difficult to sharpen and maintain.

A Rotary mowers usually have one blade which rotates very fast. Rotary Mower is a mower in which the blade spins horizontally (east to west) and uses a sucking and tearing action to cut the blades of grass. The design is simple and adapts very well to small engines. Rotary mowers can cut a wide variety of grass conditions. There are usually powered by gas engines or electric engines and the most common mowers used by home owners. Among those are as shown in Table 1.

Table 2.2.1 : Types of Lawn Mower

Types of Lawn Mower	Feature
 <p>Reel mower</p>	<ul style="list-style-type: none"> • Blades spin vertically • Use a spinning/scissoring action to cut the grass <p>Healthier for the lawn</p>

 <p>Rotary mower</p>	<ul style="list-style-type: none">•• Single blades spin horizontally <p>Uses more of a tearing action</p>
--	--

2.3 MATERIAL

The material selected must be in accordance with the required features such as product durability, reasonable cost, guaranteed product safety level and more.

1)



Figure 2.2.1: Square Hollow

Hollow steel is a type of hollow shape so it has a lot of flexibility when used for some types of construction. More precisely this shape of steel is like a long pipe that has a rectangular cavity, so it is not uncommon for many people to call this iron a square hollow.

This hollow iron has many uses. Not only as a ceiling support, but also as a material for making canopies, fences, minimalist sidewalks, fences and so on. It is even used as a main ingredient in the installation of gypsum panels and GRC panels. Because it is shaped like a rectangular pipe, it is also widely used as a contemporary interior and minimalist style furniture.

2)



Figures 2.2.2: Round Hollow

Round hollow is a type of building material widely used for a variety of purposes. For example to make fence poles, roofs, building materials, gas pipelines, air conditioners, and furniture. Round hollow has a long round shape and a distinctive color of black.

3)



Figure 2.2.3: Blade

Blades are a type of hand tools used in agricultural activities including cutting grass or harvesting crops. It looks like a crescent moon, and the inside is sharp. This device has now been widely replaced by tractors and other automated machines, but it continues to be used in some parts of Europe and Asia. Blades are used for various uses such as cutting grass, cutting twigs and other things. The sharp blades will cut the grass cleanly without tearing & ripping. Sharp blade also cut the grass uniformly.

4)



Figure 2.2.4: Wheel

Wheel is a material used in this project so that the project can move and function. The wheels also come in many sizes. So choosing the right wheel size for this project is an important factor in producing the perfect project.

5)



Figure 2.2.5: Spur gear

Spur gear is the most common type of gear. They have straight teeth, and are mounted on a parallel shaft. Spur gear is used in many devices you can see, such as electric screwdrivers, wind alarm clocks, washing machines and clothes dryers.

2.4 MATERIAL SELECTION

A. SQUARE HOLLOW

○ *Advantages Square Hollow :*

- Have a better quality.

Various layers of this type of iron are indispensable for satisfactory results. Usually there is not much iron that can withstand a fire attack, but it is able to withstand its dense layers.

- Quick and easy installation.

The advantages of this one are of particular interest to construction workers. That's because installing it fast and easy will not take much time. The hollow textures are easy to form and apply, and this is all due to the material content of the product.

- It's not easy to experience erosion

Many of the major problems with iron are corrosion, and this will make the performance of the steel unattractive and easy to break. Therefore, if you use a blank type galvalume, the risk of corrosion will be less because of the aluminum and silicone layers present.

○ *Disadvantage Square Hollow :*

There are no product has a level of perfection of up to 100%, of course there are still some loopholes or deficiencies, and this kind of iron. Among its advantages, this iron has its disadvantages, such as:

- If you want to make designs that carry a lot of weight, you cannot use this type of iron. Because, actually, this type of iron is not too heavy to bear the burden. That's because there are several layers in it.
- The size of the iron is not too long, only about 6 meters. In fact, this steel is usually only used for the construction of fences or ceilings that are not too long. However, if you want to make a roof-like design or need a longer size then you can use other types. Actually it can be connected using welding but it is still not satisfactory.

B. STAINLESS STEEL BLADE

○ *Advantages of Blade:*

- The blades machine can cut the grass uniformly and smoothly.
- The blades has a very efficient and accurate efficiency point with one push by pressing it on the phone.

○ *Disadvantage of Blade:*

- The blades may endanger the user's safety in case of incomplete installation.
- The blades can also rust if they are not cleaned or maintained.

C. Aluminium Alloy

○ *Advantages of Aluminium Alloy*

- Higher specific strength
- Higher specific stiffness
- Improve high temperature creep resistance
- Improve wear resistance

○ *Disadvantage of Aluminium Alloy*

- Lower toughness and ductility
- Prone to corrosion

2.5 CHAPTER SUMMARY

In conclusion, after conducting a study on the materials and components needed to build this project, it was found that components with appropriate specifications should be used to prevent accidental accidents. In addition, the projects we create can reduce fuel costs compared

to existing projects. It also reduces the noise that can disturb the home compared to existing projects. At the same time, the materials used for existing project repairs are significantly higher than our project cost.

CHAPTER 3

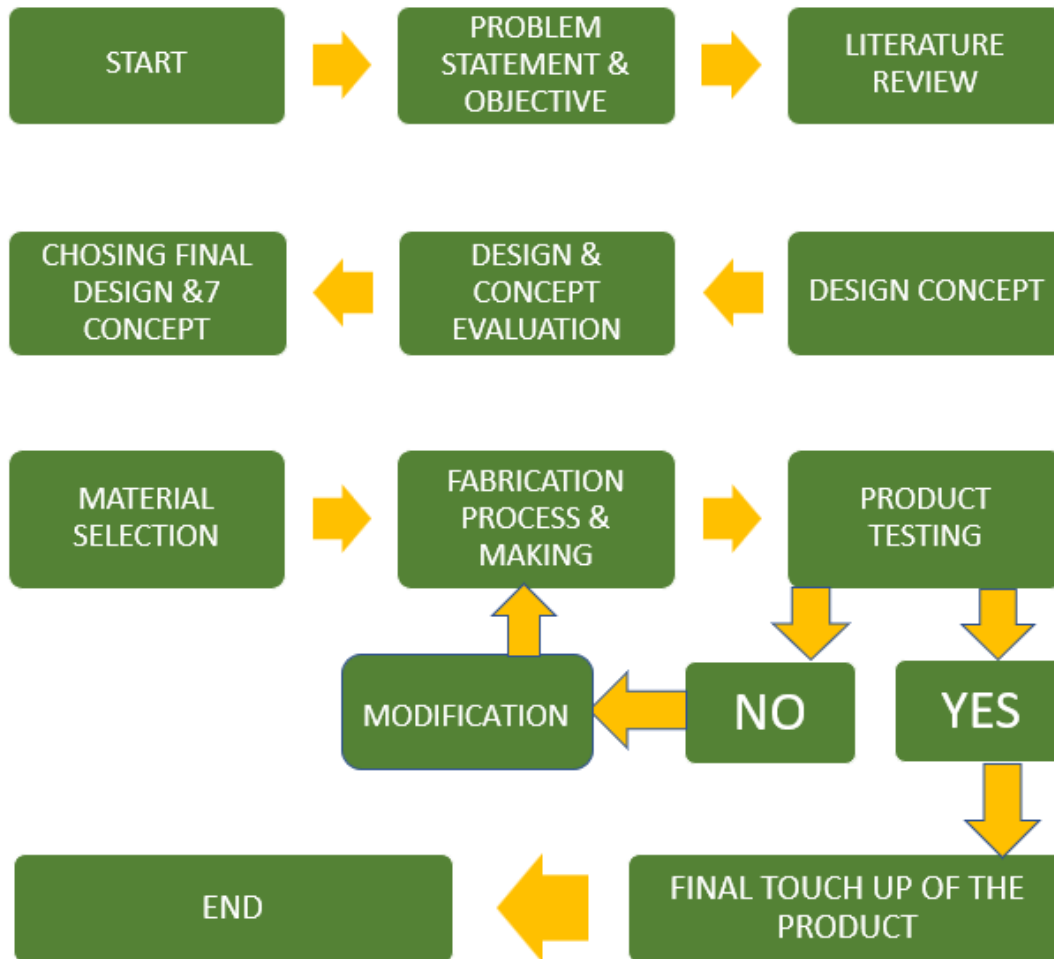
METHODOLOGY

3.1 INTRODUCTION

Methodology is a method and technique for designing, collecting and analyzing data to produce evidence that supports a study. Methodology describes how a problem is studied and why a method and technique is used.

Methodological studies are a rigorous planning in the course of this semester. In order to facilitate the final project journey, the methodology must be set as best as possible. With this, every step of the journey of this project will not fall short of the set path or more precisely the end result of the study will meet the needs of the problem to be solved. Therefore, it is very important to know and understand in depth each of the processes involved in structural engineering studies.

In this chapter, there will be a lot of information about processes and travel through the production of our final project. There is a flow chart that shows how we are doing the whole project. This flow chart describes the process we take. Next up is the Gantt Chart, which will showcase and plan for 13 weeks on the journey of our final year project.



3.3 FLOW CHART EXPLANATION

3.3.1 PROBLEM STATEMENT

- The grass cutter we used now has an engine so it takes a long time to start.
- The grass cutter that we used recently is so noisy and sometime it disturb people hearing. This problem can be categorized in sound pollution problems.
- The grass cutter we used nowadays are using fuel. Therefore the cost of using this grass cutter is quite expensive.

3.3.2 LITERATURE REVIEW

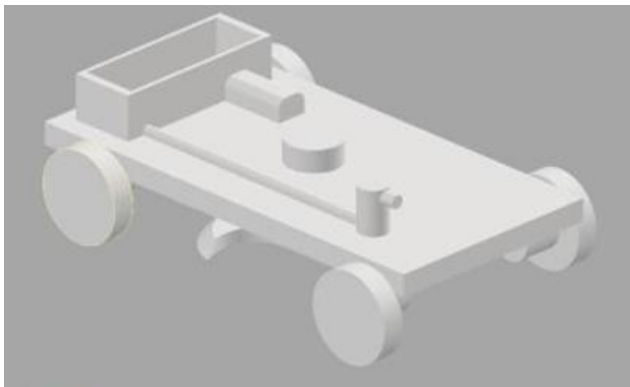
- We explain the background of mechanical lawn mowers from the founders since 1990.
- We started a project called a mechanical lawn mower.
- Our project priority is to make it easier to cut the lawn at home, school or anywhere.
We created this project not only for men but for women

3.3.3 DESIGN CONCEPT

- We discussed about the materials and design to make sure that our project could be produced in good order.
- After discussing we made a measurement for the agrobot and also made a raw sketch for the agrobot.

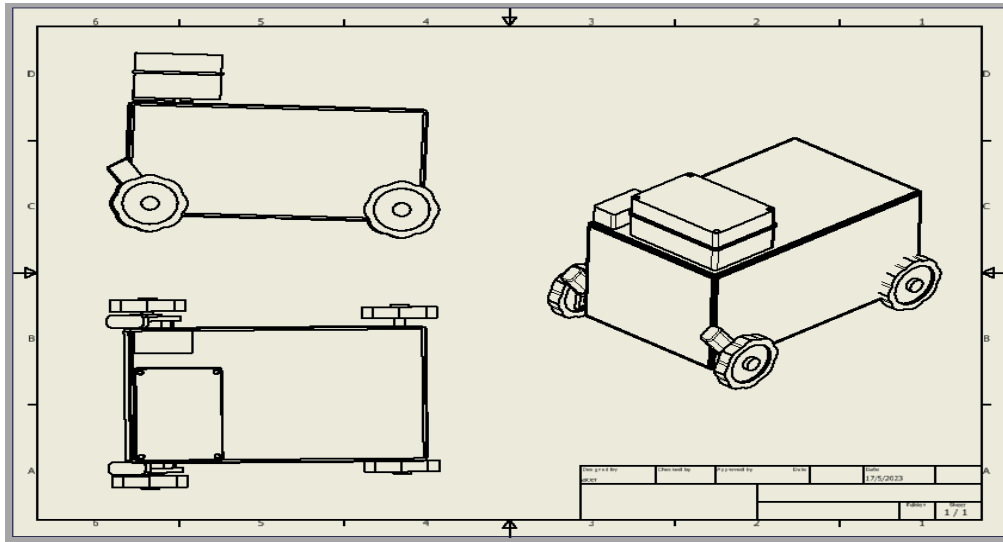
DESIGN CONCEPT

- After measuring agrobot we made a design in Autodesk inventor.







FINALISING DESIGN CONCEPT




- After making a lot of design we finally made a decision of what design to use.






3.3.4 MATERIAL SELECTION

MATERIAL	FUNCTION
<p>1. Nodemcu ESP8266</p> 	<p>-This is the main component that allows IoT technology inside the agrobot.</p> <p>-The NodeMCU (Node MicroController Unit) is an open-source software and hardware development environment built around an inexpensive System-on-a-Chip (SoC) called the ESP8266. The ESP8266, designed and manufactured by Espressif Systems, contains the crucial elements of a computer: CPU, RAM, networking (WiFi), and even a modern operating system and SDK. That makes it an excellent choice for Internet of Things (IoT) projects of all kinds.</p>

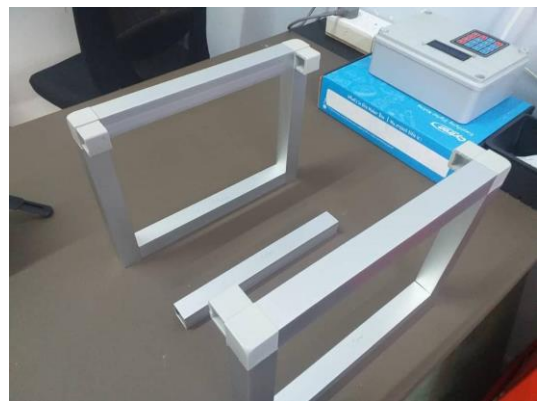
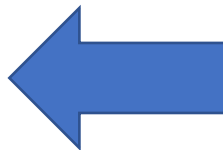
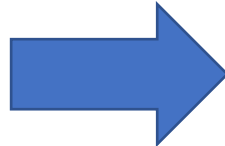
<p>2.Enclosure Box</p> 	<ul style="list-style-type: none"> - The enclosure box protects the connections, which usually contain vulnerable points such as wire splices, from environmental conditions and accidental contact. -This box can protect the agrobot board and important components from damaged.
<p>3.10 mm wheel coupling</p> 	<ul style="list-style-type: none"> -To connect the power window as wheels for the agrobot to move.
<p>4. Voltage Regulator</p> 	<ul style="list-style-type: none"> -This allows for agrobot to put a maximum voltage on agrobot's components such as the motor blade. - A voltage regulator generates a fixed output voltage of a preset magnitude that remains constant regardless of changes to its input voltage or load conditions

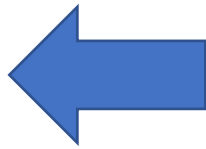
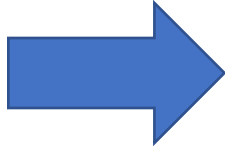
<p>5. 5vdc relay Module</p> 	<p>-To control the motor of agrobot but with only 5vdc maximum dc voltage.</p> <p>-The 5V relay module can be used to control a load such as a lighting system, motor, or solenoid. It can also be used to switch AC or DC voltages. The maximum voltage and current that the 5V relay module can control is dependent on the specifications of the relay.</p>
<p>6. Md10a Driver Module</p> 	<p>- MD10C is very robust DC brushed motor driver that supports Vmotor from 5V to 30VDC</p>
<p>7. Aluminium L and T Connection</p> 	<p>-To connect the the aluminium hollow for the agrobot's body.</p>

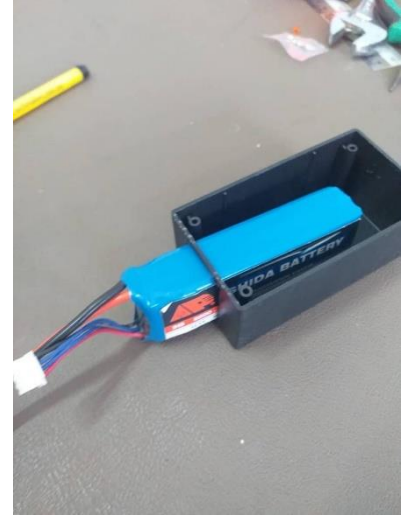
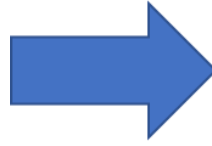
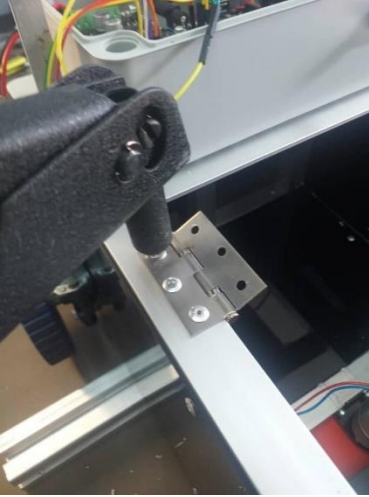
<p>8. Toggle Switch</p> 	<p>-To manually switch on the agrobot</p>
<p>9. Limit Switch</p> 	<p>-This functions as a limiter for the wheels and also the motor of agrobot.</p> <p>-Primaly linked to the board of agroboard so it can be used blynk iot.</p> <p>- Limit switches are a contact proximity sensor device that consists of an actuator mechanically linked to a set of output contacts.</p>
<p>10. Power Window</p> 	<p>-To move the wheels for the agrobot we used power window because it is rigid and not fragile.</p> <p>-It also have enough power to move the agrobot along the aluminium hollow body and the motor.</p>

<p>11. 12vdc Lippo Battery</p> 	<p>-we used lippo batter as the power source for the agrobot because it is easy to plug it in.</p> <p>-It is also rechareable.</p>
<p>12. Aluminium Hollow</p> 	<p>-For the frame of the agrobot we use aluminium hollow because it is light and also firm.</p>
<p>13. Acrylic 2mm</p> 	<p>-For the surface of the body of agrobot we use arcyclic with the thickness of 2mm.</p> <p>-we used acrylic because it is cheap and also firm.</p> <p>-Finishing the whole body with arcyclic will also give good results to the agrobot body.</p>

3.4 FABRICATION PROCESS AND MAKING



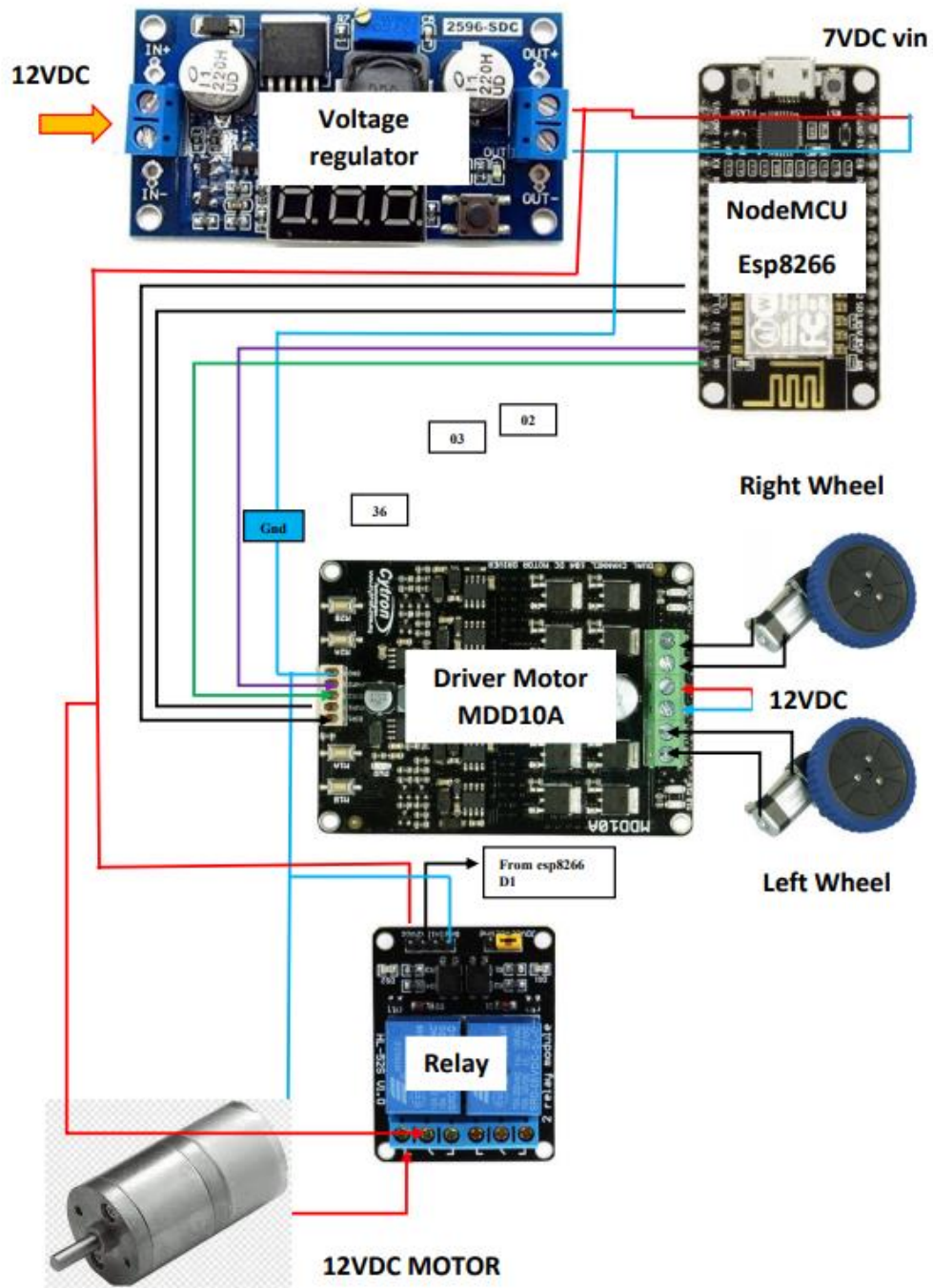




Process assembly

1. The aluminium hollow came with a measurement of 25mm x 25mm with a width of 1 inch. So we decided to cut aluminium hollow with the measurement that we measured for the frame of the agrobot.
2. Started to put the pvc holder on every joint for the aluminium hollow. Connected all of the aluminium hollow using the pvc joints.
3. Starts connecting the aluminium hollow for the back of agrobot and also in front.
4. After connecting we used the tyre to estimate the space between the ground and agrobot.
5. After confirming the measurement that we needed from ground to agrobot we decided to drill two holes at the back of the agrobot to install the tyre and also the power window.
6. After drilling the hole we started to install the tyre and also the power window.
7. After finished installing the tyre at the back of the agrobot, we did the same thing for tyre in front of agrobot but without the power window.
8. After finished installing the tyre we started to drill holes on every edge, hinges and also in the middle of the aluminium hollow so we could install acrylic for the surface of the frame of agrobot.
9. We also drilled the top of the mainframe so we can install the ansel for the acrylic on top of the agrobot.
10. We made a 3d print for the casing of the battery.
11. For the board wiring and also the other electronic parts we used an enclosure box to keep it inside. This prevents the electronic from being damaged.
12. The results of the finished agrobot.

AGROBOT Circuit Diagram



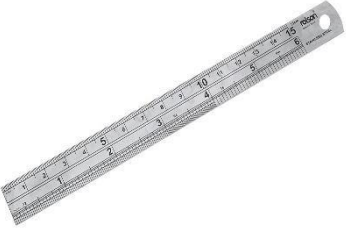



AGROBOT IOT CODING






```
#define BLYNK_PRINT Serial
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>
#define BLYNK_AUTH_TOKEN "yk8p_fS-MLVRU4B8faJGsDq2gSHwBZst"
char auth[] = BLYNK_AUTH_TOKEN;
char ssid[] = "ar";//Enter your WIFI name
char pass[] = "akmalradzi";//Enter your WIFI password
#define PBO D0
#define PB1 D1
#define PB2 D2
#define PB3 D3
#define PB4 D5
BLYNK_WRITE(V0) {
  digitalWrite(D0, param.asInt());
}
BLYNK_WRITE(V1) {
  digitalWrite(D2, param.asInt());
  digitalWrite(D5, param.asInt());
}
BLYNK_WRITE(V2) {
  digitalWrite(D2, param.asInt());
  digitalWrite(D5, param.asInt());
  digitalWrite(D3, param.asInt());
}
BLYNK_WRITE(V3) {
  digitalWrite(D2, param.asInt());
  digitalWrite(D5, param.asInt());
  digitalWrite(D1, param.asInt());
}
```





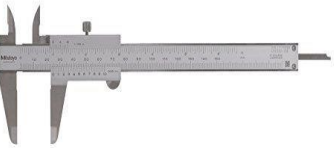
```
BLYNK_WRITE(V4) {  
  digitalWrite(D1, param.asInt());  
  digitalWrite(D2, param.asInt());  
  digitalWrite(D3, param.asInt());  
  digitalWrite(D5, param.asInt());  
}  
  
void setup() {  
  pinMode(D0, OUTPUT);  
  pinMode(D1, OUTPUT);  
  pinMode(D2, OUTPUT);  
  pinMode(D3, OUTPUT);  
  pinMode(D5, OUTPUT);  
  
  Blynk.begin(auth, ssid, pass, "blynk.cloud", 80);  
}  
void loop() {  
  Blynk.run();  
}
```



Equipment Used

NO.	COMPONENT	FUNCTION
1		<p>Steel Ruler</p> <p>-primary purpose is accurate measurement, they can also be used as guides for laying out lines, and if rigid enough, for cutting.</p>
2		<p>Straight scribe</p> <p>-We used to mark line on our framework which is on our aluminium hollow.</p> <p>-A scribe is a hand tool used in metal work to mark lines on workpieces, prior to machining</p>
3		<p>Center Punch</p> <p>-Used to mark the center of a point to show the center of a hole when drilling</p>
4		<p>L shaped ruler</p> <p>-To get a 90° angle for our framework of agrobot.</p> <p>.</p>

5		<p>Bench Clamp</p> <p>-We use this to hold our aluminium hollow so it is easier to cut.</p>
6		<p>Metal cutting saws</p> <p>To cut small aluminium parts of agrobot..</p>
7		<p>Flat file</p> <p>-To smoothen and flated the surface of agrobot frame after cutting.</p>
8		<p>Drilling Machine</p> <p>-Used to drill screws mostly for the acrylic of the agrobot.</p>
9		<p>Plyer</p> <p>-Used for gripping something round like a pipe or rod, some are used for twisting wires, and others are designed to be used for a combination of tasks including cutting wire.</p>

		-We used this mostly to cut wires.
10		<p>Allen Key Set</p> <p>-To tighten and loosen allen key screws.</p>

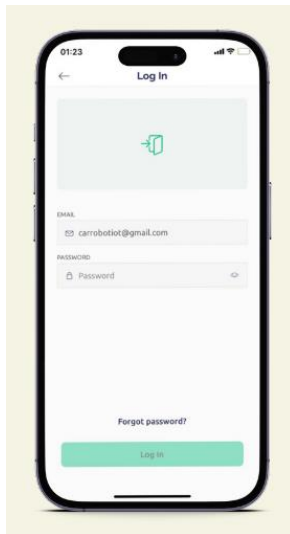
No.	Component	Function
11		<p>Screwdriver Philips and flathead</p> <p>-To tighten and loosen up screw.</p>
12		<p>Vernier Caliper</p> <p>-Caliper or calliper are an instrument used to measure the dimensions of an object, generally by placing two movable points of the instrument across the object or span to be measured.</p>

13		<p>Mallet</p> <p>-A mallet is a tool used for imparting force on another object</p>
14		<p>Aluminium Cutter machine</p> <p>- To cut the aluminium hollow.</p>

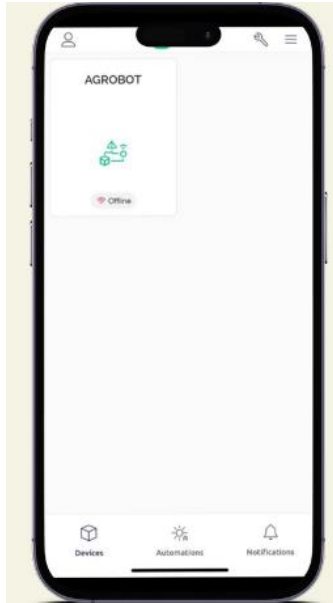
How To Use Agrobot



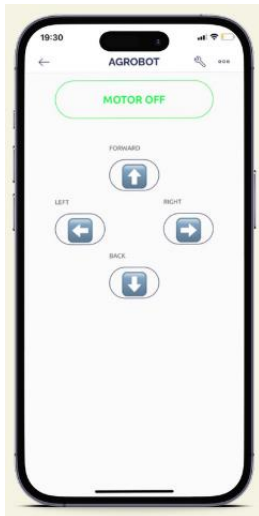
1. First search up blynk IOT on Appstore or playstore on your phone.



2. After downloading BLYNK IOT open up the application, and log in with the username and password given by our team.



3. After logging in the interface will be like this. Switch the agrobot on first and then it will be online. After it is online press the agrobot logo.



4. After pressing the agrobot logo the user interface will be like this. Once it becomes like this The agrobot is free to use.

3.5 PRODUCT TESTING

The special feature of the project is it can be controlled on any phone whether it is an iPhone or an Android. All you need to do is download BLYNK IoT on your phone and log in with the username and password that is going to be given. This product also offers an affordable price while it is free from maintenance, as a result it can save the cost by more than 30% from its rival (lawn mower). This agrobot also only uses 100% electric and does not need diesel at all. The blade will cut grass at speed and cut evenly. Although this agrobot is not as powerful as a diesel lawn mower, it has many advantages such as cost savings, doesn't require fuel, avoids noise pollution, doesn't take long to turn on and so on. After the full body and frame is done we tested it out using the application and it can be concluded that the stated objectives were achieved and implemented effectively.

3.6 FINAL TOUCH UP OF THE PROJECT

After completing our process to making the project, we start to clean and spray at the body of the agrobot. We also try our project on grass to see if it is cutting successfully or not. Our project has been done and we have submitted our project video to the supervisor.

END RESULTS OF AGROBOT





	WEEK/ PROJECT ACTIVITY	STATUS	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14
1	Project briefing, iSOLMS briefing	P	■													
		A	■													
2	IOT workshop	P				■	■	■								
		A						■								
3	Data collection and analysis workshop	P						■	■	■	■	■				
		A										■				
4	project requirement		■	■	■	■										
	project plan		■	■	■	■	■									
	project scope and limitation		■	■	■	■	■	■								
	project methodology		■	■	■	■	■	■								
		A				■	■	■								
5	Project Development				■	■	■	■	■	■	■	■	■			
	project development details	P			■	■	■	■	■	■	■	■	■			
	project techniques and tools				■	■	■	■	■	■	■	■	■			
		A									■	■				
6	validity and reliability measurement	P				■	■	■	■							
	project results and analysis					■	■	■	■							
		A							■	■						
7	Project report writing and review by supervisor	P					■	■	■	■	■	■	■	■	■	■
		A													■	■
8	Proceeding Paper review by supervisor	P									■	■				
		A										■				
9	Project Inventory Form submission	P												■		
		A												■		
10	Poster review by supervisor	P											■	■		
		A												■		
11	Mechanical Innovation, Challenge and Exhibition (MICE) SESSION II:2022/2023	P													■	
		A													■	
12	Logbook and report submission	P														■
		A														■
13	PITEC 4 PSA (Project Exhibition and Presentation)	P														■
		A														■

■ Planning
■ Actual

3.8 CONCLUSION

The conclusion that can be made in this chapter is that, after conducting the study of this chapter and gaining the knowledge, how to make the project clearer, more detailed and easy. This simplifies the work that goes into project development. The data that has been collected and analyzed is very important in making this final project. These data are collected through a variety of ways such as browsing the internet, reading some related books, in stores and through information from lecturers. This chapter also describes the cost of materials, quantities, prices and overall cost allocated to complete this project. Design study conducted it helps to simplify the process of designing how to fit in and not spend too much and the materials you want to use are easy to find. In addition, this chapter will also know the specifications of the materials available in the market as well as the different prices accordingly different shops. Material selection factors are also very important in the production of this project. This is because choosing the wrong item will cause damage to the project. Failure in this appropriate selection not only will it cause damage to the project but it will also result in higher costs of purchasing new material as a result of the damage caused by the wrong selection of materials.

CHAPTER 4**FINDINGS AND ANALYSIS****4.1 INTRODUCTION**

This chapter combines all the analysis and important data of AGROBOT and also its materials calculation. The data and analysis is very important to ensure the objective and scope of this project successful. After that, when the data analysis achieve the goals this show our project was successful.

4.3 COST**COST OF PROJECT(AGROBOT)**

NO	NAME OF COMPONENT	TOTAL UNIT	PRICE PERUNIT	TOTAL PRICE
1	<i>Nodemcu ESP8266</i>	1	RM40.00	RM40.00
2	<i>Enclosure Box /</i> Kotak Enklosur	1	RM15.00	RM15.00

3	<i>Jumper Wire Male- male</i>	1(set 40pcs)	RM15.00	RM15.00
5	<i>Jumper Wire Male- Female</i>	1(set 40pcs)	RM15.00	RM15.00
6	<i>Jumper Wire Female-Female</i>	1(set 40pcs)	RM15.00	RM15.00
7	10mm wheel coupling	2	RM50.00	RM100.00
8	Voltage Regulator <i>(Step down 40vdc -1.5vdc)</i>	1	RM30.00	RM30.00
9	5vdc relay Module <i>(Arduino Module)</i>	1	RM20.00	RM20.00
10	Md10a driver Module	1	RM50.00	RM50.00

BILANGAN	NAMA KOMPONEN / PERKAKASAN	JUMLAH UNIT	HARGA SEUNIT	HARGA KESELURUHA N
11	<i>Aluminium L & T Connection</i>	10	RM1.00	RM10.00
12	<i>Toggle switch</i>	1	RM8.00	RM8.00
13	<i>DC Indicator Lamp 12vdc</i>	2 pcs	RM12.00	RM24.00
14	<i>PCB Stand</i>	8pcs	RM1.00	RM8.00
15	<i>Dc 12v Motor Power window</i>	2 pcs	RM100.00	RM200.00
16	Limit switch	1	RM5.00	RM5.00
17	Banana jack	1	RM10.00	RM10.00
18	5 inch wheel	2	RM65.00	RM130.00

19	12vdc Lippo Battery	1	RM85.00	RM85.00
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20	Aluminium Hollow 1 inch	2	RM75.00	RM150.00
21	Arcyclic 2mm	1 set	RM50.00	RM50.00
TOTAL				RM 980.00

Table 4.3 shows the cost of materials allocated to implement the AGROBOT project.

4.4 CHAPTER SUMMARY

The conclusion is that in this chapter we can see all of the price of each component of agrobot. Therefore it is for us to estimate the price in the future.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 INTRODUCTION

Based on the results obtained in Chapter 4, a discussion of the finding is presented in this chapter. The findings from the study are used to discuss whether the proposed hypotheses are supported. All research questions will be answered subsequently and finally the achievement of research objectives are determined. Vendors are provided with managerial implications and recommendations, to enable them to draft appropriate strategic in gaining consumers' intention to purchase lawn mower. Finally, the contributions of the study are discussed based on theoretical, methodological, practical approaches and end with suggestions for future research.

5.2 DISCUSSION

Our agrobot can traverse any grassy area and perform cutting tasks simply by using your phone. The use of this machine provides the opportunity for the user having the potential to help reduce environmental impacts related to air pollution such as human health, acid rain, greenhouse effect and global warming and so on. The Agrobot is an efficient, modern-day agricultural product. This also proves that IoT technology is applicable on agricultural products. Generally this agrobot is a lawn mower specially created or specifically for housewives or smallholders. We have discussed and conducted product testing to ensure that the mechanical agrobot works well within the prescribed scope of only being able to mow the lawn at an area of 20x13 hectares. And the test shows the set scope is true and quite accurate. But to improve our products to be more effective we need to add more torque for the motor to the cutting part so that this machine can work more smoothly effectively. As a conclusion, applying IoT technology on an agrobot (lawn mower) was successful but there is still many improvements that can be made.

5.3 SUGGESTION

This AGROBOT is a machine that works to cut grass evenly at a certain area by just using an application on your phone. So there are some suggestions for improvement to make this agrobot more effective, example:

- Add a machine safety system by cutting aluminium hollow and put on the left and right hand side of the agrobot. This could prevent the blade under agrobot from flying out of bounds from the agrobot.
- Add a water pump feature. This could be another innovative idea for the agrobot. With the water pump agrobot can cut grass while watering the plant.
- Add an iron handle on the agrobot so it can be carried easily.
- Add another aluminium hollow in front of the agrobot so it can act as a pusher to push tall grasses.
- Make the agrobot body with an adjustable height so it can traverse even higher grasses.
- Change to higher torque for the motor of the blade. So it can cut thicker grass.

5.4 CONCLUSION

The use of this machine for physical use of grass provides the opportunity for the user to maintain and enhance their healthy lifestyle, while also having the potential to help reduce environmental impacts related to air pollution such as human health, animals and plants, depletion of ozone layer, acid rain, greenhouse effect and global warming and so on. Users can reap the benefits as mentioned above, especially for environmental impact prevention, and possibly for treatment the purpose is, as consumers take a proactive approach to health as they are aware that some pollution can reduce the risk of chronic disease. To achieve this goal, this thesis has taken the initiative to study factors of buying this Agrobot to housewives, farmers, lawn mowers and other public persons. As a conclusion the objective of this project has been achieved, which is applying IoT technology on agriculture product and also creating a convenient product for the agriculture community,

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