DEPARTMENT OF MECHANICAL ENGINEERING

IOT FORSQUID JIGGING

DJJ50193 PROJECT 2

SESI 1 : 2021/2022

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Finally, a million thanks to everyone who helped make this project a reality, whether directly or indirectly. The assistance provided to me was invaluable, from the tiniest to the largest.

ABSTRACT

IOT Squid Jigging Machine is a mechanical machine used for jigging squids to solve the problem of fishermen in Malaysia who still catch squid traditionally using nets and fishing rods. The idea of this project was due to the less quantity of the squids which is unprofitable to the fisherman where only small amount of squids can be jigged during a particular time. Besides, there is a lack of awareness of technology on the aquaculture areas especially marine and this is main factors why the technology are difficult to be applied in more needed areas. Thus, this project goals are to design and develop a machine for a new technique in squid jigging activities.

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CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

Jigging is the practice of fishing with a jig, a type of fishing lure. A jig consists of a lead sinker with a hook molded into it and usually covered by a soft body to attract squid. Jigs are intended to create a jerky, vertical motion, as opposed to spinnerbaits which move through the water horizontally. The jig is very versatile and can be used in both salt and fresh water. Many species are attracted to the lure which has made it popular among anglers for years. For successful jigging, the jigger needs to use a rod which is good for feeling a strike, and needs to stay in contact with the lure and get it to where the squid are. Most squid caught by jigs are on or near the bottom.

The better quality jigs can feature a layer of tape that provides reflective or silhouetting characteristics for all times of day and light conditions. It therefore stands to reason that the tape colour used is influenced by the amount of ambient light in the atmosphere. Dark red, purple and pink tape are suitable for low light applications (during dawn, dusk or on overcast days), whereas silver and gold provide strong reflection and can capture a squid's attention on a bright day. Rainbow coloured tape provides a combination of flash and silhouette so is a good all-rounder. In now modern days, traditional jigging activities were still used in Malaysia but oversea countries have already made their own jigging machine. Plus, most of this machine's 6 parts especially oblong and roller were actually only sold outside of Malaysia, but we have proved that we can make it ourselves without purchasing the expensive one. So in this chapter, the details of materials used, the work principle of jigging and even the types of squids will be explained as well as comparison between traditional and existing method of jigging.

1.2 PROBLEM STATEMENT

There are many fishermen and anglers who use jigging machine manually. The use of jigging machine manually is just a waste of energy and slow to get results.

1.3 RESEARCH OBJECTIVES

- To design a new technique in squid jigging activities using Arduino system in order to save time and manpower.
- To fabricate a squid jigger which is able to increase the quantity of squids during particular time.

1.4 RESEARCH QUESTIONS

i. Is the automatic method good for jigging?

ii. Does making this IOT for squid jigging machine require a high

cost?

iii. What type of motor is needed for jigging machine?

1.5 SCOPE OF RESEARCH

i.   This product can be exposed to water regularly.

ii.   This product could recyclable.

iii.   Not suitable for small ships but still can use it.

iv.   Uses adruino system.

v.   Could last for a long time with a good care.

1.6 SIGNIFICANCE OF RESEARCH

Although, the traditional method of jigging squids are currently popular in Malaysia and jiggers were enjoyed using it. However, some jiggers especially fishermen that work with jigs as an occupation need to catch a lot of squids in a particular time and moreover, the demand of squids in Malaysia are quite huge. Thus, the finding of this study will bring a lot of benefits to fishermen as well as jiggers in which this affordable machine can increase the amount of squids to be jigged. In addition to that, it will show the contribution of technology in the marine areas. It will absolutely benefits Malaysia to sit as low and stand as high with other developed countries.

1.7 DEFINITION OF OPERATIONAL TERMS

Aquacultural: The cultivation of marine or freshwater organisms.

Marine: Relating to or found in the sea.

IOT technology: The application of scientific knowledge for practical purposes, especially in industry.

1.8 SUMMARY OF CHAPTER

In this chapter, the studies was explained on the root of the ideas and motives. The objectives were based on the problem statements that were made during discussion and brainstorming. The main advantage of this machine was its price, in which it is affordable along with functionality to increase the amount of squids to be jigged and enjoy the jigging as the work become much easier. Even if it is exposed with water and air, but with the help of the material used, corrosion can be reduced well. Thus, this first jigging machine could be applied into a new method of jigging squids and can last longer with a really good care.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter, the material used for fabricating squid jigging machine will be shown with its own uses. Also, traditional method of jigging activity will be compared to our own machine where both methods have their own uniqueness and functionality. Jigging has been with us thousands of years ago, but mostly just to catch fish as an ultimate survival. Since then, more people reinvent and evolved with the passage of time. There is no specific human who first invented squid jigging activity, however a Japanese master jig fisherman, Yoichi Mogi was the one who re-invented this methods and techniques which have proved to be deadly on most species of fish across the globe.

The most common squid jig will have a keel shaped chin weight that makes the jig sink steadily with a head down attitude at an angle of roughly 45 degrees. These chin weighted jigs are mostly used and are a good general purpose jig. Head weighted jigs feature a tow point on top of the jig and are forward weighted. They tend to cast better and sink faster, making them ideal for shore based jigging with more violent actions. Thinner profiled jigs lend themselves to faster jigging whereas jigs that are wide will have more buoyancy and slide from side to side with a subtle retrieve.

In now modern days, traditional jigging activities were still used in Malaysia but oversea countries have already made their own jigging machine. Plus, most of this machine's 6 parts especially oblong and roller were actually only sold outside of Malaysia, but we have proved that we can make it ourselves without purchasing the expensive one. So in this chapter, the details of materials used, the work principle of jigging and even the types of squids will be explained as well as comparison between traditional and existing method of jigging.

2.2 HISTORY OF IOT SQUID JIGGING

The term Internet of Things is 16 years old. But the actual idea of connected devices had been around longer, at least since the 70s. Back then, the idea was often called "embedded internet" or "pervasive computing". But the actual term "Internet of Things" was coined by [Kevin Ashton](#) in 1999 during his work at Procter & Gamble. Ashton who was working in supply chain optimization, wanted to attract senior management's attention to a new exciting technology called RFID. Because the internet was the hottest new trend in 1999 and because it somehow made sense, he called his presentation "Internet of Things".

Even though Kevin grabbed the interest of some P&G executives, the term Internet of Things did not get widespread attention for the next 10 years.

2.3 DEFINE SQUID JIGGING MACHINE TECHNOLOGY

IOT its all about the data and the Internet of Things (IoT) refers to a system of interrelated, internet-connected objects that are able to collect and transfer data over a wireless network without human intervention.

The personal or business possibilities are endless. A 'thing' can refer to a connected medical device, a biochip transponder (think livestock), a solar panel, a connected automobile with sensors that alert the driver to a myriad of possible issues (fuel, tire pressure, needed maintenance, and more) or any object, outfitted with sensors, that has the ability to gather and transfer data over a network.

Today, businesses are motivated by IoT and the prospects of increasing revenue, reducing operating costs, and improving efficiencies. Businesses also are driven by a need for regulatory compliance. Regardless of the reasons, IoT device deployments

provide the data and insights necessary to streamline workflows, visualize usage patterns, automate processes, meet compliance requirements, and compete more effectively in a changing business environment.

2.4 EQUIPMENT OF SQUID JIGGING

2.4.1 MOTOR

This is the progressed high performance "squid jigging machine" which inherited the traditional great features such as "AC servo motor is loaded," and "high-speed cycle time is realized by a round drum".
In particular, the "sharp stick slide" by a round drum not only has a good articulation but also realizes the nylon string trouble reduction and the improvement of the operation efficiency, it has been pleasing the customers.

Figure 2.4.1: Motor

2.4.2 ARDUINO

I will be using an Arduino to make this jig. Arduinos are very standard, easy to power and are a breeze for short projects like this. The Arduino also have a proto shield PCB

Figure 2.4.2: Arduino

2.4.3 MAGNETIC SENSOR

Our magnetic sensors are known for robust durability and dependable operation for any position or current sensing application. Whether detecting the proximity of a magnet, performing rotational calculations, or precise, low-drift current measurement, our Hall effect sensors and magnetic current sensors will provide reliable and accurate measurement data to control your system.
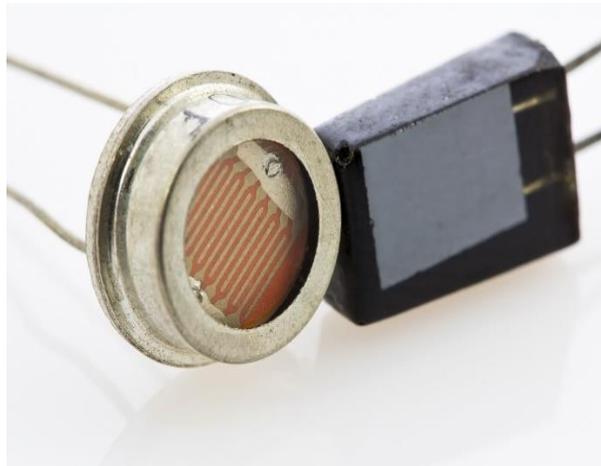
Figure 2.4.3: Magnetic Sensor

2.5 SUMMARY OF CHAPTER

To conclude this chapter, literature review is important to showcase all the studies of materials, methods and concepts to enhance the knowledge on this project. Every articles, thesis and news that is related to jigging activities have given us lots of beneficial information. Material selection of this project is definitely stainless steel due to its recyclable properties, same goes to other materials that suitable in the production of Squid Jigging Machine.

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

Methodology is a contextual framework for research, a coherent and logical scheme based on views, beliefs, and values, that guides the choices researchers make. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge such that the methodologies employed from differing discipline vary depending on their historical development. This creates a continuum of methodologies that stretch across competing understandings of how knowledge and reality are best understood. This situates methodologies within overarching philosophies and approaches.

In this chapter, a lot of information about the process throughout the fabrication of Squid Jigger will be elucidated. There will be flow chart and methodology phases showing start until the end process of us building the whole project with its explanation. Next, is the Gantt Chart, which will show the actual and planning throughout all the 15 weeks of our final year project journey whereas project budget shows the total price for all the materials that we have selected.

Moreover, we also include fabrication activities such as welding, drilling, cutting and assembling to create a more specific details on the production of Squid Jigger. These activities were generally applied from the courses we had took during Semester 1 until Semester 4. Hence, this chapter will fully explained the production of this project.

3.1.1 METHODOLOGY FLOWCHART

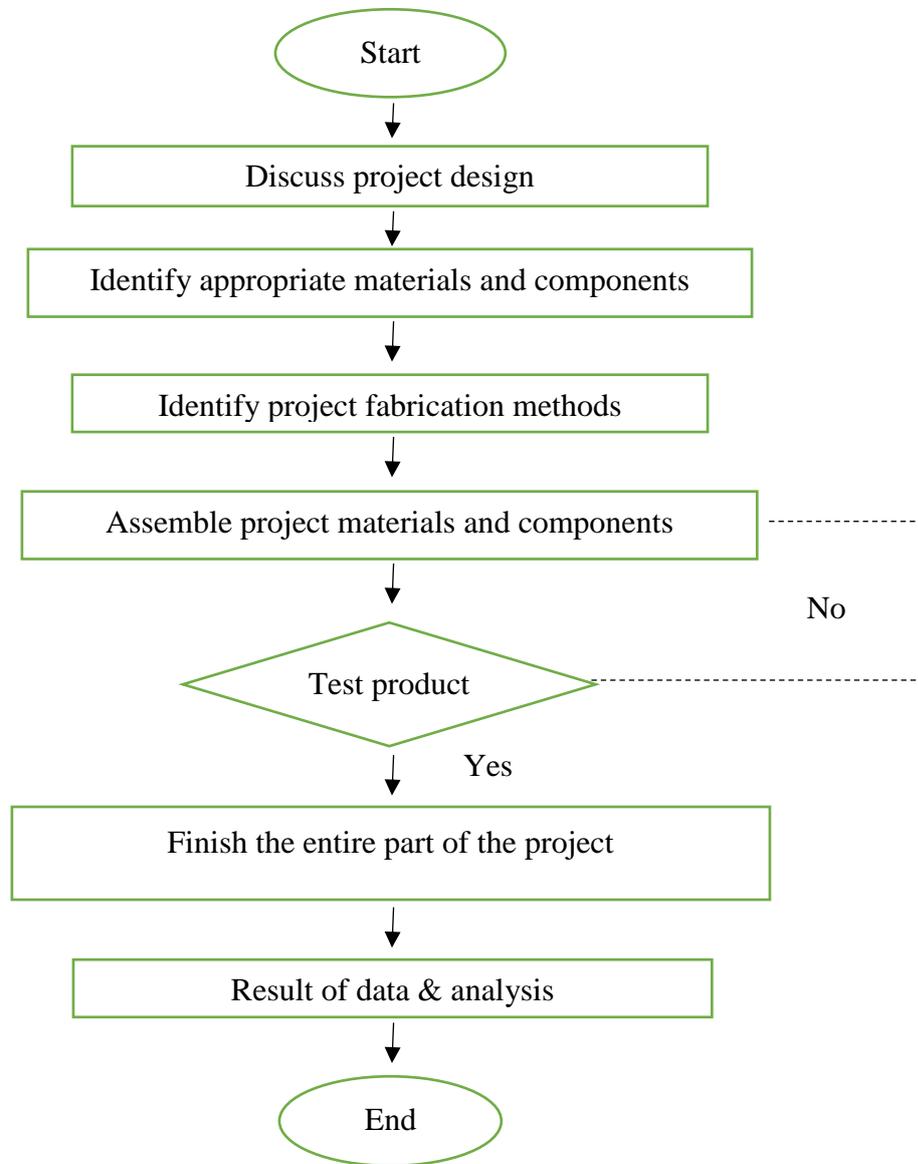**Figure 3.1.1** Project Development Methodology Flowchart

3.2 PRODUCT DESIGN

Product design describes the process of imagining, creating, and iterating products that solve users' problems or address specific needs in a given market. This project design include base, roller, oblong, timing belt, bearing, arm, motor and magnetic sensor and full drawing of assembly which was designed using Autodesk Inventor.

CHAPTER 4

RESULT AND ANALYSIS

4.1 INTRODUCTION

In this chapter, its had present data and analysis derived from the testing of iot for squid jigging machine. This is to ensure that all research objectives and scope are met. To ensure the project's success, every piece of data had been analized.
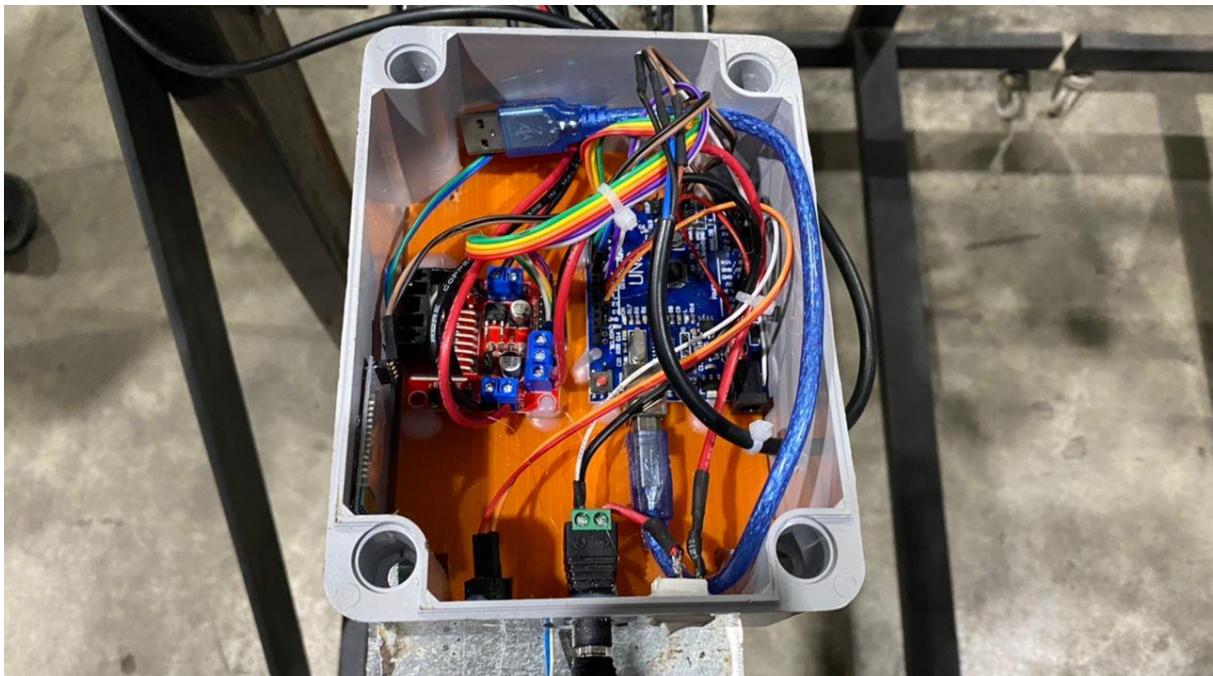
4.2 THE CASING :

As we can see the above, it was the casing for the product that made of using 3D printing method.With all the measurement of the casing,we had put and arrange the Arduino board and the sensors.

4.3 DISCUSSION

As had been discussed, we had known that this project was a good achivement to ourself and others people. We can see that this project brought us a lot of good advantages plus achive the objective. For us, this project was a great headstart to gain more experience and knowledge about engineering and Iot which can lead us to help more people in the future as a mechanical engineering's students. We use the 3D printing process to make a casing, and the material that we use is PLA filament. PLA is both recyclable and biodegradable, making it the most environmentally friendly filament around.

4.4 SUMMARY

This chapter had explanained that the result of the project have a great success rate as it develop well in the community.So much that we had learned from the result and gradually practice it in this new norm.Even with so many hurdle we crossed path,we had countinuesly getting better to overcome the problem so as result it happen with flying colours.As the method we used, we had could do many of the mechanical practices that been learn especially for the programming and the 3D printing. As a result, we also get the great result when we doing asome test even we still cannot go to the sea.

4.4 FINDINGS PRELIMINARY RESULT

- ❑ The magnetic sensor of this product can detect jigging within 1.5 m longer after 1 round rolling.

- ❑ The battery that be used can kept up the function of the sensor till 21 days.

- ❑ The casing is neatly constructed so that no water can enter.

- ❑ The motor is function perfectly so it dont have problem when rolling.

4.5 CONCLUSION

For the conclusion we had discussed,we had conclude that there are advantages and disadvantages of this project.We really hope that the advantages we achive from this product can provide benefits and convenience to the community. Next to the shortage, we also will improve and been looking for more research on this project so that it will had reached its maximum capabilty.Therefore,this project will be beneficial in the future. More testing and analysis should be done so that the product will be more accountable in the future.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

In this chapter, it is explained the project in terms of finishing and suggestion based on the product perfomance. To ensure that the product were deserved high praise, all of the recommandation had been displayed here.

5.2 CONCLUSION

In a nutshell, this project is helpful in many ways that can be observed. The benefits of this project can solve the problem that fishermen got when jigging , which is the iot squid jigging of the new norm. This proves that this iot for squid jigging machine is a good innovation project.

5.3 RECOMMENDATION

The motor we want use more powerful so we can do more acceleration.speed and the far of jigging can go.Also we want use the magnetic sensor more functionly so we can detect really detail when the oblong rolling.

5.4 PROJECT LIMITATION
- Time taken for the sensors to detect : 1 second
- Distance for the sensors to detect : 1.5 metre

5.5 SUMMARY

This chapter had explained that, this project had achived a great success.So many conclusion and recommendation could be made to help this project walks to become more great or maybe the greatest project in the future.

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APPENDICES

1

ATTACHMENT A	Gantt Chart (Project 1)
ATTACHMENT B	Gantt Chart (Project 2)
ATTACHMENT C	Project Budget

GANTT CHART (PROJECT 1)

WEEK ACTIVITY	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Briefing and Project Planning	■	■												
	■	■												
Material Selection			■	■	■									
			■	■	■									
Material Purchase						■	■	■						
						■	■	■						
Project Design						■	■	■						
						■	■	■						
Fabrication									■	■	■	■	■	■
									■	■	■	■	■	■
Proposal Writing											■	■	■	
											■	■	■	
Slide													■	■
													■	■
End														■
														■

Planning	■
Implemantation	■

Gantt Chart (Project 2)

Week / Activities	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14
Course registration	■													
Write the Final Report	■	■	■	■	■	■	■	■	■	■	■	■	■	
MyIPO Registration		■												
Assemble project materials and components			■	■	■	■								
Product testing							■							
Finish the entire part of the project								■						
Data Analysis									■					
Plagiarism Review (Turnitin)										■				
Progress Presentation Project Progress Presentation										■				
Presentation Preparation											■			
Abstract review by supervisor											■			
Technical Paper Review by supervisor											■			
Correction/Refinement of Final Report												■		
Abstract Review by Interpreter												■		
Submission of Final Report													■	
RICE PSA														■
Logbook Submission														■

PROJECT BUDGET

NO.	ITEM	DESCRIPTION	PRICE (RM)
1	Hole Stainless Steel	25 mm x 25 mm	80.00
2	Hole Stainless Steel	20 mm x 20 mm	65.00
3	Bearing	20 mm diameter	18.00 x 6 =108.00
4	Bolt and Nut	12 pieces	3.00 x 7 =21.00
5	Belt	50 cm	10.00
6	Cylinder Stainless Steel Hole	20 mm diameter	50.00
7	Magnetic sensor	2 pieces	4.50 x 2 =9.00
8	Arduino	1 pieces	109.00
9	Motor	1 pieces	845.00
TOTAL			1,297.00