

**FACULTY OF MECHANICAL ENGINEERING DIPLOMA IN MECHANICAL ENGINEERING**

**( PROJECT 2 DJJ 6143 )**

# FINAL REPORT OF :

Automatic Fish Farm Feeder

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**POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH**

**AUTOMATIC FISH FARM FEEDER**

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A project submitted in partial fulfillment of requirements for the award of Diploma in Mechanical Engineering

**MECHANICAL ENGINEERING DEPARTMENT**

**DECLARATION OF AUTHENTICATION AND OWNERSHIP**

**AUTOMATIC FISH FARM FEEDER**

**TITLE :**

 **SESSION : JUNE 2020**

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2. We agree to release the project’s intellectual properties to the above said polytechnic in order to fulfil the requirement of being awarded **Diploma in Mechanical Engineering**.

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## Abstract

## The construction of this invention is intended to produce a machine that automatically feed fish using ADRUINO UNO and HTC Bluetooth Module. It is a main controller which is placed at the fish cage area. The objective is to solve problems that occur as factors fish feeding that are not systematically, reduce the surplus of fish food in the pond and create a tool that is more systematic and more practical. Development of this project involves electronic electrical and mechanical. To control the setting time, electronic devices such as timers and circuit board is used. This device allows the feeding to be more systematic base on time that has been set. Surplus food can also be reduced with the use of electronic devices where the food is given in the fish cage based on the time setting. Several other methods have been used as reference such as previous studies and also the fish food feeder machines in the market and that have been produced by certain individuals. With the development of this invention indirectly can become an innovation to the construction of landscape in the future

## Keyword: small and compact, portable, affordable

## ABSTRAK

## Pembinaan projek ini bertujuan untuk menghasilkan mesin yang memberi makan ikan secara automatik menggunakan ADRUINO UNO dan HTC Modul Bluetooth. Ia adalah alat kawalan utama yang diletakkan di kawasan sangkar ikan. Objektifnya adalah untuk menyelesaikan masalah yang berlaku sebagai faktor makan ikan yang tidak sistematik, mengurangkan lebihan makanan ikan di kolam dan membuat alat yang lebih sistematik dan lebih praktikal. Pembangunan projek ini melibatkan elektrikal dan mekanikal elektronik. Untuk mengawal masa pengaturan, alat elektronik seperti pemasa dan papan litar digunakan. Peranti ini membolehkan pemberian makanan menjadi lebih sistematik berdasarkan masa yang telah ditetapkan. Lebihan makanan juga dapat dikurangkan dengan penggunaan alat elektronik di mana makanan diberikan dalam sangkar ikan berdasarkan pengaturan waktu. Beberapa kaedah lain telah digunakan sebagai rujukan seperti kajian sebelumnya dan juga mesin pengumpan makanan ikan di pasaran dan telah dihasilkan oleh individu tertentu. Dengan perkembangan penemuan ini secara tidak langsung dapat menjadi inovasi kepada pembinaan lanskap pada masa akan datang

## Kata Kunci: ringkas dan kukuh, mudah alih, mampu milik

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**CHAPTER 1**

**INTRODUCTION**

* 1. **INTRODUCTION**

Automatic fish feeder has long been implemented but only for domestic. So our group has decided to make our own automatic fish feeder that can be implemented in commercial farming. This product is to help fish farmer to reduce their work time, amount of work needed to feed and reduce the risk of over feeding which is common case in stock farming sector. This product also can give the farmer a really accurate time for feeding the fish for more efficient growth of the fish. This product can be left unattended for a whole month and it also reduce power consumption which the product use a battery to powered it up and nature friendly.

This product is easy to use for a fish farmer that just started out because this product just need to set which time the farmer want n how much food is given to the fish. The body of the product is a light weight, durable plastic that can endure any type of weather without giving a complication in the system. This light weight body can make more easy and fast installation without disturbing the fish.

* 1. **PROBLEM STATEMENT**

Fish farmer often having cage-related problems with their fish. The main thing that happens is how to avoid the occurrence of delays in feeding the preserved fish and how to have a consistent fish feeding period. These things will often cause the owner to have to change or replace their fish because they are easy to die due to non-feeding time factor consistent. For those who are concerned they will try to resolve this problem easily and for a long-term solution. By due to that, this product was created to solve problems, facilitate and also eases the work of feeding cage fish as well introducing new technologies for the field of fish farming

* 1. **OBJECTIVE**

Fish have a feeding schedule of once per day every day, making it difficult for the fish owner to be away from home, whether it be for school, work, or leisure. This creates the need for an automated device that can reliably feed a fish. The goal for this project is to design a system for automatically feeding a fish.

* 1. **SCOPE OF THIS PROJECT**

This report outlines the steps that our group took to develop our final prototype as well as recommendations for future versions of our device. Not included in this report are customer responses and feedback to the product.

**1.5 CONTRIBUTION**

It is not feasible for fish owners to leave extra food in their fish’s tank before leaving for an extended period. Overfeeding fish is one of the leading causes of fish fatality. When the food begins to break down in the tank, the proteins release ammonia, nitrites, and reduce the amount of oxygen in the water, all of which are harmful to the fish). This can put a strain on fish owners who need to leave home and do not have a consistent feeding. While there are many options available especially for pets but not for livestock.

* 1. **SUMMARY OF CHAPTER**

Automatic fish farm feeder was made to help those farmer that does two job at a time. It has simple mechanic and very easy to use. It also has a good feeding efficiency which made fish more healthy.

**CHAPTER 2**

**LITERATURE REVIEW**

**2.1 INTRODUCTION**

Before we could begin designing our own automated fish feeding system, we needed to learn about any existing products, relevant patents, and any regulations regarding the project. In this section we discuss commercially available feeders, other automatic dispensing units, patents for feeding systems, OSHA requirements, different fish tanks, foods, and fish species. We also list the functional requirements that drove our project.

**2.2 PREVIOUS RESEARCH**

There are many different kinds of automated fish feeders from which consumers can choose. We aim to design a feeder that improved upon these current systems. Below are three products currently on the market. The first system is the eBoTrade Aquarium Auto Fish Food Timer. This device is shown in Figure 1 below. The eBoTrade Aquarium Auto Fish Food Timer can feed between one and four times per day, has manual and automatic capabilities, an adjustable serving size, and a ventilation system to keep the food dry. For this system, the food reservoir rotates and a door on the bottom will open to allow the proper amount of food to be released into the tank (Fish feeder, automatic fish feeder, eBoTrade aquarium tank auto fish food timer.). This system has mixed reviews on Amazon. Some of the concerns about the system are that even at the smallest serving size it feeds too much food for a single fish, and condensation formed inside the food reservoir causing the food to rot. Also, the mounting system is not very stable so the user must be careful not to bump it, and the door would not open when expected.

The second system is the EHEIM Automatic Feeding Unit. This device, like the one described above, rotates the food tank to dispense the food. The system is pictured in Figure 2 below. The EHEIM Automatic Feeding Unit features an adjustable opening for different serving sizes, “simple digital programming for different intervals,” a manual snack option, a food reservoir large enough to feed for six weeks, and up to eight feedings per day (EHEIM automatic feeding unit.). The system has many customer reviews on both Amazon and the Petco website; some of the negative reviews were that it was difficult to get the appropriate amount of food to 4 come out and that as the device rotates it dumps some food onto the tank’s cover resulting in both a mess and waste.

**2.3 EQUIPMENT**

* FISH FOOD CONTAINER

The will be where the food save and then dispense into the pool.

* POWER SOURCE

Battery are being used as power source to powered the motor to move the motor.

* **SERVO MOTOR**



The motor is used to open and close the food dispenser.

**2.4 OPERATION DESIGN**

****

This design was made after doing some research and discussion to ensure the design can fulfil the objective of the project and the problem statement. After designing a lot of the prototype, this is the one that we choose that show the most efficient at dispensing a recommended amount of food needed for the fish.

**2.5 SUMMARY OF CHAPTERS**

 In this chapter, it is an explanation on how literature reviews were done and the reasons why this project has been selected. There are many of case study stated and related to our project regarding to improve the automatic fish farm feeder. Since the common fish feeder is only for pets fish indoor, it will work less efficient if used outdoor. The existing fish feeder is only used for indoor thus using it outdoor will lead to a lot of echanical problem. Therefore, in chapter 3 there will be explanations of the methodology of project on how the project are made and assembles.

**CHAPTER 3**

**METHODOLOGY**

**3.1 INTRODUCTION**

Methodology is the rules or procedures used to implement the project in detail. This step is very important step in the implementation of this project to ensure the project is successfully completed at set times. Furthermore, in this chapter, there are many methods used in order to finish the project. In producing a project, this step that must be taken before the project is completed. These steps should be done with the utmost precision in order to produce a quality project. The result of this project, there are some steps have been made. The next topic is topics selection.

 Selection of topics is very first step before starting work encountered work related to the project. The project title should be appropriate to the level sought diploma as a final project for the course Diploma in Mechanical Engineering.

 In addition, the selection of appropriate projects to help power the creative and innovative thinking as well as it symbolizes the level of consciousness of a person.

 After the project is selected, the title of the project should be selected based on its ability to attract others to know more about the project closely. Tittle that attracts the attention of others symbolizes the initial status of the project.

 After an appropriate tittle is chosen, the step that must be taken is to choose components to the project to be made. This is because the materials are difficult to be found will have an impact on the projects to be made because it will probably take a long time to get it.

**3.2 FLOW CHART**

**I**

Figure 3.2.1: I & II Flow chart of the methodology

YESSSS

NO

NO

YES

**3.3 SAFETY MEASURE**

 Safety in operating the project toward the user is one of the important things that must be think about. The safety measure that have been done in this project is as follow:

1. The main board for the system has a neat placement of wiring so no circuit shortage can occur.
2. Use of PVC for the prototype frame thus making it lighter to handle.

**3.4 PROJECT BUDGET**

|  |  |
| --- | --- |
| **Materials** | **Price** |
| **Servo Motor** | RM 20.00 |
| **Container** | RM 15.00 |
| **PVC** | RM 20.00 |
| **Electrcal Wire** | RM 5.00 |
| **Power source** | RM 20.00 |
| **Adruino UNO**  | RM 50.00 |

**Table 3.4.1**

**3.5 PROJECT PLANNING**

Project planning is important to ensure that all of work are done in time and perfectly.

 **GANTT CHART**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **WEEK** | **STATUS** | **W1** | **W2** | **W3** | **W4** | **W5** | **W6** | **W7** | **W8** | **W9** | **W10** | **W11** | **W12** | **W13** | **W14** | **W15** |
| **PROJECT ACTIVITY** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| BRIEFING FOR FINAL YEAR | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DISCUSSING INITIAL PROPOSAL | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| LITERATURE REVIEW | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| STUDY OF OPERATION | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SURVEY THE COMPONENTS | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PREPARE FOR PROPOSAL REPORT AND PROPOSAL PRESENTATION | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PRESENTATION | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SUBMIT FINAL PROPOSAL REPORT AND PRESENTATION | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PREPARE THE PROJECT | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 3.5.1: Semester 4 Gantt chart

**Legend:**

|  |  |
| --- | --- |
| Planning |  |
| Implementation |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **WEEK** | **STATUS** | **W 1** | **W 2** | **W 3** | **W 4** | **W 5** | **W 6** | **W 7** | **W 8** | **W 9** | **W 10** | **W 11** | **W 12** | **W 13** | **W 14** | **W 15** |
| **PROJECT ACTIVITY** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DATA RESEARCH | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| RECUIREMENT SYSTEM ANALYSIS | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CONSULTATION | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CIRCUIT DESIGN | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PROJECT IMPLEMENTATION | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CIRCUIT TESTING | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| REPORT | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PRESENTATION | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 3.5.2: Semester 5 Gantt chart

**Legend:**

|  |  |
| --- | --- |
| Planning |  |
| Implementation |  |

**3.6 SUMMARY OF CHAPTER**

In this chapter, project planning and phases are made and being implemented during the project production in order to ensure the process go smoothly. It also helped to as a reference to ensure that we achieve the objective on time. Without a proper schedule, the production of the product will be delayed and the efficiency in making the product will dropped because of it. This show that methodology is one of the importance things that need to be done properly because it give a huge impact in this project.

**BAB 4**

**RESULT AND ANALYSIS DATA**

**4.1 INTRODUCTION**

This chapter describes the analysis of data followed by a discussion of research findings. The findings relate to the research questions that guided the study. Data were analyzed to identify. Data were obtained from self-administered questionnaires, completed by 20 respondents; 13 males and 7 females.

A total of 20 questionnaires were received, all of the questionnaires were usable for this study and met the required inclusion criteria as discussed in the previous chapter. The purpose of analysis is to seek public opinion on our product and improve our marketing.

For questionnaires, there are part A and part B. Part A is demography where we need to know the details about respondents. We will get to know about respondents’ gender, age, occupations and how many time their fish pets died to overfeeding so we can implement it to fish farm. For part B, the questions will be asking about our product whether it is useful, effective and good to be marketed.

**4.2 TOOLS USED**

**4.2.1 PVC SAW**

A saw that is generally use for cutting pvc pipe .

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**4.2.2 MEASURING TAPE**

A tape measure or measuring tape is a flexible ruler used to measure size or distance.

**4.2.3 HOT GLUE GUN**

Hot glue gun for bonding every type of material and has lots of versatility.



**4.3 RESULTS**

This project will overcome all of the problem that occurs as such below:

1. No more overfeeding fish
2. No need to be chase time to feed fish
3. High battery capacity lessen the visit

The feeding can be done easily and efficiently.

**4.4 SUMMARY OF CHAPTER**

 This chapter discuss about all of the result that have been achieve. Hence, the tools that are used in making of this machine are one of the important things in order to get the desire result. It is necessary to choose the most suitable tool because it gives a big impact towards the project.

**CHAPTER 5**

**DISCUSSION, CONCLUSION AND UPGRADED**

**5.1 INTRODUCTION**

Automatic fish feeder has long been implemented but only for domestic. So our group has decided to make our own automatic fish feeder that can be implemented in commercial farming. This product is to help fish farmer to reduce their work time, amount of work needed to feed and reduce the risk of over feeding which is common case in stock farming sector. This product also can give the farmer a really accurate time for feeding the fish for more efficient growth of the fish. This product can be left unattended for a whole month and it also reduce power consumption which the product use a battery to powered it up and nature friendly.This product is easy to use for a fish farmer that just started out because this product just need to set which time the farmer want n how much food is given to the fish. The body of the product is a light weight, durable plastic that can endure any type of weather without giving a complication in the system. This light weight body can make more easy and fast installation without disturbing the fish.

**5.2 DISCUSSION**

After analysis, a design is refined in terms of building function, materials used and economic conditions. At this stage a scale drawing is drawn to get a true picture of the project. Once everything is completed then the construction process of ‘Auto Fish Farm Feeder’ is done. The construction is based on the connection of structures that are joined using certain methods so that it can be used properly and safely. The structure is designed and built to support the load or force so that the structure is strong, not easily collapsed or damaged. Build structures will experience static loads, dynamic loads or both. Therefore, some important aspects in design need to be given more attention such as: I. Strenght of structure II. Size of the equipment III. Installation and maintenance factor IV. Safety factor

**5.3 CONCLUSION**

A clear methodology is very important before conducting a study. This is because the quality of the study depends on the accuracy of the use of methods that are appropriate to the study objectives, objectives and questions set by the researcher. This methodology should use the correct and systematic techniques to produce the findings of ideas that have high validity and value. This chapter has described some of the enabling used in the questionnaire instrument, namely the ways in which fish pond operators feed their livestock fish. In addition, data collection procedures such as questionnaires and data analysis methods consisting of Morphology Chart are also described to ensure that ideas can be combined and digested smoothly and systematically as well as produce quality and innovative projects.

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