**DESIGN AND DEVELOP A SMART AUTO FEMASI SYSTEM**

**(FEEDER MACHINE WITH SOLAR INTEGRATE & INTERFACE WITH GSM)**

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**Bachelor of Electrical Engineering**

**(Power Electronic and Drive)**

**June 2012**

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"I hereby declare that I have read through this report entitle "Design and Develop a Smart Auto FEMASI (Feeder Machine with Solar Integrate and Interface with GSM) System" and found that it has comply the partial fulfillment for awarding the Degree of Bachelor of Electrical Engineering (Power Electronic and Drive)"

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# DESIGN AND DEVELOP A SMART AUTO FEMASI SYSTEM
# (FEEDER MACHINE WITH SOLAR INTEGRATE & INTERFACE WITH GSM)

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**This Report Is Submitted In Partial Fulfillment of Requirement for the Degree of Bachelor in Electrical Engineering (Power Electronic and Drive)**

**Faculty of Electrical Engineering**

**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

**2012**

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# ABSTRACT

The construction of this invention is intended to produce a machine that automatically feed fish using PIC 16F877A, Microcontroller. It is a main controller which is placed at the pond 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 the microcontroller 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 pond based on the time setting. By interface with the new technology such as GSM more give this project look unique. 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. The results of testing conducted this project has been functioning well and has achieved the objectives of the construction of this invention. With the development of this invention indirectly can become an innovation to the construction of landscape in the future.

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# ABSTRAK

Pembinaan ciptaan ini adalah bertujuan untuk menghasilkan satu mesin automatic dalam memberi ikan makan dengan menggunakan PIC16F877A Mikrokawalan. Dengan menngunakkan komponen ini dapat memastikan ikan ternakkan dapat makan dengan secukupnya dan membesar dengan sihat. Dimana dalam komponen ini telah diprogramkan waktu dan jadual ikan makan. Tujuannya adalah untuk mengatasi memberi makan ikan secara tidak sistematik dan mewujudkan salu alat yang lebih sistematik dan praktikal. Pembangunan projek ini melibatkan kerja-kerja elektronik, elektrik dan juda mekanikal. Bagi mengawal masa penetapan, alat-alat electronic seperti mikrokawalan telah digunakan. Penggabungan dengan penggunaan teknologi baru seperti GSM dapat membuatkan mesin ini lebih unik. Beberapa kaedah telah digunakn sebagi rujukan seperti kajian sebelumnya dan juga mesin pemberi makan ikan di dalam pasaran yang telah dihasilkan oleh individu tertentu. Keputusan projek ini telah berfungsi dengan baik dan telah mencapai objektif pembinaan mesin ini. Dengan pembangunan reka cipta ini secara tidak langsung boleh menjadi inovasi untuk pembinaan landskap pada masa akan datang.

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| A-SI | Amorphous silicon |
| CMOS | Complementary metal-oxide-semiconductor |
| EIA | Electronic Industry Association |
| FEMASI | Feeder Machine Solar Integrate and Interface With GSM |
| GND | Ground |
| GSM | Global System Mobile Communication |
| HEX | Hexadecimal |
| LED | Light Emitted Diode |
| LCD | Liquid Crystal Display |
| PDU | Protocol Data Unit |
| PIC | programmable Integrated Circuit |
| RAM | Read Access Memory |
| ROM | Read Only Memory |
| TTL | Transistor-Transistor Logic |

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# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction

This project is design and develop Smart Auto FEMASI that‟s mean feeder machine with solar integrate. This kind of machine is feeding fish without observation, because this kind of machine is using timer to control the feeding time which is three time per day. By using microcontroller as main component this machine is automatic system during the feeding time. The time of feeding can change or adjust according to the fish needs. The unique of this machine is interface with Global System for Mobile Communication (GSM) to send message if food in container in low condition by using level sensor. By created this machine get help fish get enough food and can growth health.

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## 1.2 Problems Statement

Nowadays, there are people willing to spend hundreds or thousands of money for their fish [11]. The price of exotic fishes also gets higher and can reach thousands ringgit and steel the attention from buyers. Problems occurs if the owner is away from home or been busy and forget to feed the fish. It will be such a waste if fish that is very expansive died because of the owner is too busy to feed the fish. These FEMASI system can solve this problem by providing system that can feed the feed with the feeding time is required by the user. Next, if there is error occur to the automatic system, when the owner are away, they cannot be notify that there is problem and their fish did not get the food supplement. Therefore, besides feeding the fish at required time, user can also monitor their fish

## 1.3 Objective

- To design an intelligent system of automatic fish feeder using PIC microcontroller.
- To develop and implement a system, which uses; Global System for Mobile Communication (GSM) modem to send the (SMS) to the owner when the sensor is trigger.
- To combine together all hardware skills, electronic knowledge with some software development in building this project.

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## 1.4 Scope

Scope of this project is about study of fish in the ponds and about their habitat, which focus on eating habits. By combination with new technology the microcontroller is used in this project to control the feeding time to ensure that fish enough get food and feed fish in automatic. Due to the pond is located at outside solar system is applied on this project as power source. To make this project look more unique Global System for Mobile Communication (GSM) was applied too. The functionality of GSM is to send message to inform the owner that the food in the container is lower level that control by using level sensor also the red LED will be light during this level.

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# CHAPTER 2

# LITERATURE REVIEW

## 2.1 Introduction

The purpose of this chapter is to provide the review of previous invention of fish feeder in many journals from various references. Besides, this chapter also reviews some components that will be used in this project with some other related studies. The contain of this chapter focus on the aquaculture field, types of pond and fish, fish food type and their composition, and the previous design of fish feeder itself.

## 2.2 Aquaculture

Aquaculture is the farming of freshwater and marine plants and animals. Evidently, all aquaculture is done in water and, because it is a farming activity, involves the considerations of property or the farmer who owns the products and activity or work is done in order to raise the animals or plants. Sometimes, the terms "aquiculture" and "aqua farming" are also used. This activity was done in many water source types such as river, pond, lake and others. Today‟s industrialist take part in this activity by investing a large amount of money in managing, inventing and also marketing the output of aquaculture which promise a good potential as a profit source to gain back a good income to them or their company[9].

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## 2.3 Type of ornamental pond

### 2.3.1 Mud Pond

Ornamental ponds may be constructed by simply digging a hole and filling it with water. Ornamental ponds constructed in native soils are commonly called mud ponds. Mud ponds seldom maintain clear water, because of suspended soil particles or growth of plank tonic algae. Mud ponds are favored by the Japanese for growing large koi and for development of coloration and patterns of the fish [11]. Mud ponds are excellent for growing aquatic vegetation and develop more stable ecosystems than ponds with liners, but mud ponds seldom maintain clear water. They do not require filter systems, although supplemental aeration is recommended during summer to avoid fish kills from low dissolved oxygen. Mud ponds should contain a drain. At some time, the pond will require draining to conduct maintenance such as sediment and debris removal. An overflow drain will also minimize pond levee damage from storm water during large precipitation events [10].

### 2.3.2 Fiberglass Pond

This pond is usually not too large because in Malaysia, the cost of creating and providing the ponds is too expensive. The advantages of this type of pond is easy to maintain and more durable. Other than the pond of this type is very light. It also suitable for those who do not want this pond remain in one place that means, the pond of this type can moved anywhere. Normally fiberglass pond is not using to preserve the ornamental fish, but more suitable to make swimming pool [10].

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### 2.3.3 Concrete Pond

Concrete pond is a pond made of composite material commonly used in construction. It is combination of cement and aggregate such as sand, fine and coarse aggregates. These materials are loaded in a specific rate as prescribed. This pond is popular in Malaysia because it is very easy to constructed, and cheap if compare with fiberglass pond. Normally people make this pond to preserve the ornamental fish [10].

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