UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPING QUAILS EGG BOILING & PEELING MACHINE

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor's Degree in Engineering Technology (Electronic Industry) (Hons.)

by

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BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

TAJUK: **DEVELOPING QUAILS EGG BOILING & PEELING MACHINE**

SESI PENGAJIAN: **2017/18 Semester 1**

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I hereby, declared this report entitled “Developing Quails Egg Boiling and Peeling Machine” is the results of my own research except as cited in references.

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Date : 20 DECEMBER 2017

APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Industrial Electronic) with Honours. The member of the supervisory is as follow:

ABSTRAK

Projek tahun akhir bertujuan mendedahkan pelajar menjalani kajian teknikal yang lebih tinggi kepada pemikiran dan logik yang perlu dibangunkan untuk memastikan sesuatu yang dapat mengintegrasikan idea menjadi sesuatu yang berguna. Ini biasanya dimulakan oleh permulaan idea atau konsep, yang bukan sahaja bertujuan untuk membangunkan produk (Perisian Hardware), tetapi juga kajian yang mendalam tentang produk sebelum ini yang sedia ada dalam kategori yang sama dan kekurangan mereka. Oleh itu pendekatan yang diambil untuk mencadangkan penyelesaian, yang lebih baik dari yang sebelumnya dari satu segi atau yang lain. Dengan pendekatan yang sama dalam fikiran, saya, pelajar tahun akhir Sarjana Muda Teknologi Kejuruteraan Elektronik (Elektronik Industri), telah mengambil "Developing Quails Egg Boiling and Peeling Machine" sebagai projek tahun akhir saya. Dengan ada nya mesin ini, ia dapat membantu pengguna mempercepatkan proses pengupasan telur puyuh dan menjimatkan tenaga pekerja.

ABSTRACT

The final year project aims at exposing the students undergoing higher technical studies to the thoughts and logic that must be developed to ensure that one is able to integrate his/her ideas into something useful. This generally is initiated by the inception of an idea or a concept, which not only aims at developing a product (Hardware of Software), but also the in-depth study of the earlier existing products in the same category and their deficiencies. Accordingly, an approach is taken to propose a solution, which is better from the previous ones in one respect or the other. With the same approach in mind, I, the final year student of Bachelor of Engineering Technology Electronic (Electronic Industry), have taken up the "Developing Quails Egg Boiling and Peeling Machine "as my final year project. With this machine, it helps the user to speed up the quail eggs and save labour.

DEDICATION

This report is dedicated to my beloved parents who educated and supported me throughout the process of doing this project. I am also wanted to say thank u to my supervisor and my friends who have encouraged, guided and inspired me to complete this project.

ACKNOWLEDGEMENT

Special thanks to Allah S.W.T for His blissful and gift because giving me this ability to finish my Projek Sarjana Muda (PSM). This report is as a mark of my sincere appreciation to Universiti Teknikal Malaysia Melaka (UTeM) by giving me this opportunity further study on Bachelor's Degree in Electronics Engineering Technology (Industrial Technology) in Faculty of Engineering Technology (FTK). I would like to thank to my supervisor, Mr Tg Faisal Bin Tengku Wook for the guidance, advices, encouragement, inspiration and attention given throughout the day in development of my final year project and while writing this report entitled as Developing Quails Egg Peeling and Boiling Machine. With this continuous support and interest, he guided and supported me in completing this project with full commitment and dedication. My gratitude goes to my beloved family and my friends that always give courage and support me to achieve the goal of my project. Thanks to their moral support and care they had given to me up until this project done.

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LIST OF SYMBOLS AND ABBREVIATION

RVM	=	Reverse Vending Machine
LCD	=	Liquid Crystal Display
LED	=	Light Emitted Diode
FPGA	=	Field Programmable Gate Array
SBRM	=	Smart Bottle Recycle Machine
IDE	=	Integrated Development Environment
TTL	=	Transistor-Transistor Logic
DC	=	Direct Current
NO	=	Normally Open
NC	=	Normally Closed
UART	=	Universal Asynchronous Receiver-Transmitter
ICSP	=	In Circuit Serial Programming
USB	=	Universal Serial Bus
AC-DC	=	Alternate Current to Direct Current
SRAM	=	Static Random Access Memory
EPROM	=	Erasable Programmable Read-Only Memory
PWM	=	Pulse Width Modulation

CHAPTER 1
INTRODUCTION

1.1 Background Information

For centuries, quail were considered a great delicacy to be cooked by eminent chefs and enjoyed only by diners with an appreciative palate. Until recently, these small migratory birds were available almost exclusively to hunters in the wild. In the last few years, however, they have become a supermarket specialty item and are on the menus of casual café's and bistros as well as elegant restaurants.

Quail farming is becoming more popular and is being promoted in a number of Asian countries. Today millions of quail are raised in China, Hong Kong, India, Indonesia, Japan, Malaysia, the Philippines, the Republic of Korea, Singapore and Taiwan, Province of China. Considerable quantities of quail meat and eggs are already being consumed in France, Italy, Spain, Greece and Hungary while, in the America continent, commercially raised and processed quail are marketed in a limited number of establishment, particularly in the United States, Canada, Brazil and Chile.

(M.M.Shanaway,1994) states in general terms, the eggs is formed of three major component is yolk, albumen and shell. The albumen is by far the greatest component of egg mass, followed by the yolk and the shell. The quail eggshell is about one-third thinner than the chicken's. However, the thickness of the shell membranes in relation to total shell volume in quail eggs is four time that in chicken eggs. Quail eggs are slightly elongated compared with chicken eggs. Table 1.1 shows the physical characteristic of standard quail and chicken eggs.

Table 1.1: Physical Characteristic of standard quail and chicken eggs

	Quail	Chicken
Egg weight(g)	10.3	56.7
Albumen (%)	56.5	57.1
Yolk	32.6	31.1
Shell (%)	9.9	10.7
Shell thickness (mm)	0.19	0.31
Egg shape index	78.5	73.3

1.2 Problem Statement

Nowadays, more important agriculture and livestock farming as an example of the field continues to grow with further technologies developments. More technologies were creating to further develop the field. The problems which often occurred due to this method are:

1. Does not have boiling and peeling machine for quail eggs.
2. Taken long time to peel when massive quantity.

1.3 Project Objective

The propose of this project is to be developing a Quail Eggs peeling and boiling machine. Thus, the objectives of this project are as stated below:

1. To study the quail eggs, boiling and peeling machine.
2. To developing a quail eggs boiling and peeling machine.
3. To evaluate the performance of quail eggs boiling and peeling machine.

1.4 Scope of Project

The scope for this project is to develop a quail eggs shell peeling and boiling machine. Firstly, to operate this machine, user will have required inserting the quail eggs into the boiler and push safe button to on the system then the boiler will turn on and temperature sensor will energize the temperature in the boiler after approximate around 10 minutes the machine will automatic shift the boiled quail eggs with using power window motor to the next process which is separating the shell. This process is done by using a twisting rubber roller. After that, the egg is directed to basket for collection process.

1.4 Organization of thesis

Organization of thesis is divided into five chapter that is explain about all procedure and method for complete this project. Each of the chapter separately because of the different tittle for completed this project. This thesis covered on the introduction, literature review, research methodology, discussion, conclusion and recommendation.

For the first chapter, this thesis covered with the overview of the project. This means, people know about this project without follows its progress for development of this project throughout overview. Then, overview covered by introduction of the project, problem statement which are the reasons this project should develop, project objective, and scope of work. The purpose of objective was created because this project based from the problem statement to develop a solution. Then, this project will follow the objective to make this project successfully. Then scope of project that is the methodology has been use in order to complete this project. It consists usage of software and hardware.

Chapter 2 focuses on the literature review. Literature review is information that has been used as references by researching in journal, books, internet and many more. Literature review contains all the facts, methodology, scopes project, idea and view of the author about research. Furthermore, this literature review also explains about the basic knowledge of Arduino, infrared sensor, buzzer and many more.

Chapter 3 focuses about the methodology that has been used to complete this project. This part is elaboration and details about the usage of hardware and software. Methodology is important part because it consists the flow of the project. If it not organized correctly it will causes problem to achieve in this project.

Chapter 4 consists of the results were obtained from the testing and modification process in order to complete this project. This part it should have simulation, testimony and many more result from the test to this project. Furthermore, this result important because it can determine the circuit and component correctly before the hardware were in process. From this part component can buy based on the simulation thus can save the money from waste by build the wrong circuit.

Lastly chapter 5 is made after through all process and methodology to achieve the objectives for this project. This part is the conclusion that has been concluded based on the final stage of project. Furthermore, this part will explain and discuss detail about this

project. Then, a future recommendation for this project also include to improve this project by using the latest technology or can adding some features to make it more usage for this project.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

Literature review was research part about the whole project to gain knowledge and skills needed to complete quail eggs peeling and boiling machine. The main for this part are from the previous project and thesis that related to this project. This source is able to obtain from books, journals and articles from internet. Then, by analysis the project did by other researchers, there is a possibility to know what features are lacking in their project. It is very important to improve and to develop a successful project.

2.1 Past Related Research

2.1.1 Design & Analysis of Boiled Egg Peeling Machine

(Patil et al., n.d.) state the purpose of this research has been to study hardness of boiled egg and temperature of boiled egg so that could find the most efficient way to peel the hard -boiled eggs peeling of boiled eggs is very difficult task for cook or chief. Eggs peeling machine is hardware which is utilized to peel the bubbled eggs in mass amount. Essentially our machine is completely in light of the manual technique utilized as a part of lodgings to peel the egg i.e. Shake the egg in a glass of water. This machine is helpful for school lodgings, eateries, huge inns where mass amount of eggs required. The machine is convenient and simple to convey. Extremely straightforward components are utilized as a part of this machine. A dc motor, circular disc, binary links etc, this operation also can be done by less skill worker. The machine is made to reduce the human effort and complete the job efficiently.

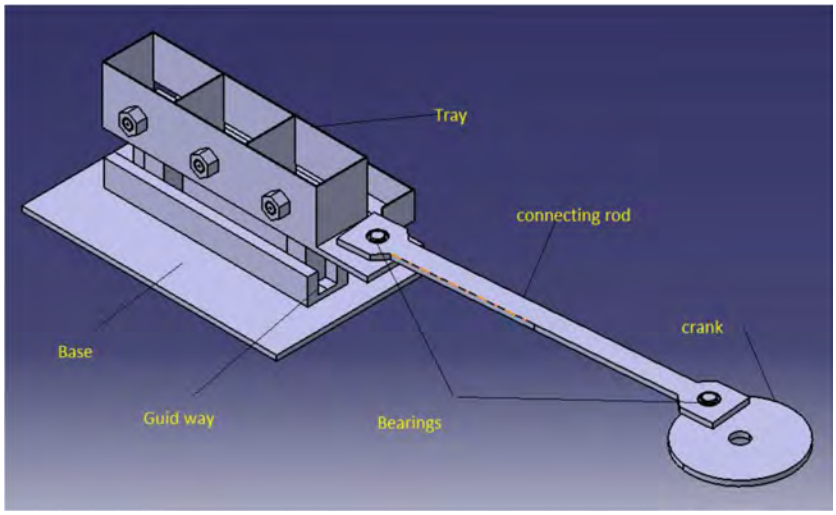

Figure 2.1: Module of Machine

Above figure shows the assembly of the machine. Machine is works on the motor. The circular disc is driven by the motor. Disc having small offset to act as a crank. As the rotor rotates, Circular disc transmit the power to the tray through the connecting rod, here rotary motion is converted into linear motion. There is a bearing provided in between circular disc and connecting rod to allow the motion of disc is rotary and the motion of rod is oscillating. Similarly another bearing is provided in between another end of connecting rod and hook of tray to allow oscillating motion of connecting rod and linear motion of tray. Patil, Swapnil S et al.(2017).

2.1.2 Design, Fabrication and Testing of a Semi-Auto Green Mango Peeling Machine

(Donado et al., 2016) states that with the year-round production of mangoes in the Philippines as well as the increase in demand for mangoes in the country, there is an urgent need to mechanize mango processing particularly mango peeling. There are definite opportunities to improve existing technology, reduce costs, increase quality, speed, and sanitation. For that, this project to involve an initial effort to design, fabricate and test a semi-auto green mango peeling machine. Pre-sorted fruit are placed manually one at a time to the feeder mechanism which is fed to the peeling section where the fruit is clamp prior to peeling process.

Pivoting peeling blades mounted on a rotating ring engage and peel the mango longitudinally along the long axis of the mango fruit. Before the next blade engages the fruit it is rotated in its longitudinal axis so that the peeling blade peels the next unpeeled section. This is repeated until the fruit is completely peeled. Results were promising with at least 75% of the mango skin peeled, however, significant improvements and modifications are required to improve quality of peeling and increase the percentage peeled area.

2.1.3 Gamification of a Recycle Bin Emoticons

(Berengueres *et al.*, 2013) introduced an emoticon bin which is a recycle bin giving a smiles and sounds as a reward to the users. In this project, they scope in consumption of plastics bottles which is in the third highest rank in the world where about 750 million bottles per year but only 10% to 12 % of plastics bottles being recycled in 2011 (Abu Dhabi Environment Agency, 2010). The PET bottles that not being recycled will damage the environment when it goes to landfills. This project also motivates to recycle and increase the recycling rates. This emoticon bin consists of LCD screen, proximity sensor and speakers. The system starts when a user drop the PET bottles, the sensor sense and a coin sound is played. In the same time, the LCD screen that displays a poker face will change into a smile figures during one second. The ultrasonic sensor is used in this machine as a non-moving part bottles detector.

2.1.4 Industry Based Automatic Robotic Arm

(Thomas et al., 2013) state a definition used by the robot institute of America is: "A robot is a programmable multifunction manipulator designed to move material, parts, tools, or specialized devices through variable programmed motions for the performance of a variety of tasks". In this project, we are using three geared DC motors each of which can be controlled by L293D motor driver. Here, two reference positions are chosen. First reference position is the place from where the arm has to pick the object and second reference position is the place where the robot has to place the object. First the microcontroller signals the motor-3 via driver circuit one to make the rotation of the arm to the desired direction.

Then the signal from microcontroller is given to driver circuit1 to drive the 2nd motor so that it can make up and down movement. Next motor 1 which is situated at the gripper is activated so that gripper holds the object. Next, motor- 3 is again activated to turn the motor towards destination direction, motor is then activated to make the down movement of the arm and finally, gripper motor is activated to release the object. Meanwhile, an obstacle sensor, which is connected to the microcontroller, is programmed such that it senses the presence of the obstacle in a radius of about 10cm and first time it senses the obstacle, it pauses its work for some time. If again the obstacle is not cleared, a buzzer will be turned on to grab the attention of a personnel to clear the object.

2.1.5 Apparatus for Peeling Boiled

(Phillips et al., 1994) state a boiled peeling device is provided for gently and completely removing the shell from boiled egg. The device includes a plurality of parallel peeling roller connected with a circulating chain drive. In the upper segment of the chain drive, the peeling rollers are driven for rotation in the same direction. Above the rollers on the upper segment of the chain drive are provide pairs of pushing plates that are reciprocated back and forth along the axes of the rollers. The egg are rotated by the roller about their longitudinal axis and moves back and forth by the pushing plates in the gap between the rollers, whereby the shells are gently and completely removed from the eggs.

CHAPTER 3

METHADOLOGY

This chapter focuses on the procedures in developing a project of Developing Quails Egg Boiling and Peeling Machine. This procedure for this project is to develop and elaborate a flow chart hat been developed in proposal paper. Each of the steps in flow chart will be explaining in more details and show what is the actual process involve in this project.

3.1 Flow Chart

Flow chart was a type of diagram represented process involved in this project. Flow chart is used for analysing, designing, and managing process for this project. Before this project proceeds, a timeline was planned on how the process of this project will be done as shown in Figure 3.1. This flow chart shows a process of developing the project by follow each of steps in Gantt chart as shown in Appendix A. This timeline is divided in 2 parts which each part covered for one semester and each semester consists of 15 weeks. For this semester, it only focused on writing a report and researching of project. The coming semester will be more focus on the project hardware and based on that the result will obtain interpretation and discussion. Conclusion will make at last. Refer to Appendix A for further information.

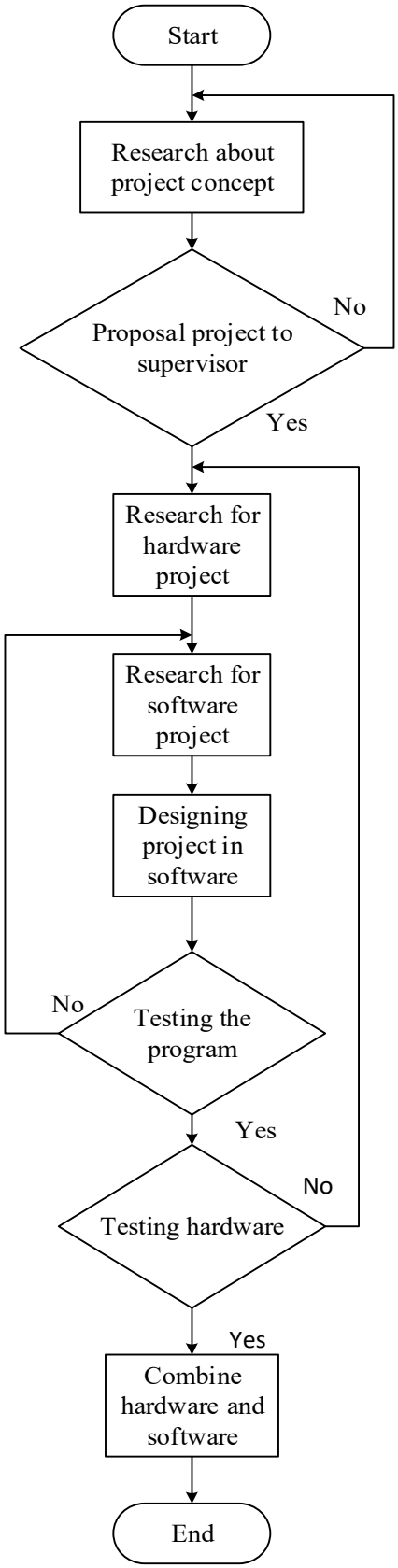

Figure 3.1: Flow Chart