POLITEKNIK
MALAYSIA
MUKAH

TEBALOI ROLLING MACHINE

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PROJECT REPORT VERIFICATION

This report entitled **"Tebaloi Rolling Machine"** has been submitted and reviewed as to meet the conditions and requirements of project writing.

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ABSTRACT

"Tebaloi Rolling Machine" is a prototype which design for the first machine to roll the tebaloi dough become flat. Thus, it can overcome problems faced in making tebaloi which is quite complicated and takes longer time throughout the process. The main objective for this prototype design produce and create a machine that uses electrical power as a main drive and to generate the motor. Moreover, it does not require a lot of manpower. This project suitable to use in small and medium industry (SMI) to ease them to produce Tebaloi. The method to this project is this machine uses compressor as a mechanism to rolls the pulley. The pulley then rolls to rolling the roller and flat the dough. The purpose of this project is to design and build a Tebaloi Rolling Machine that can be use for the traditional cookies entrepreneurs. At the end of this project, we hope that this machine can ease the Tebaloi production.

ABSTRACT

"**Tebaloi Rolling Machine**" adalah prototaip yang direka untuk mesin pertama untuk melancarkan doh tebaloi menjadi rata. Oleh itu, ia dapat mengatasi masalah yang dihadapi dalam membuat tebaloi yang agak rumit dan memakan waktu lebih lama sepanjang proses. Tujuan utama untuk desain prototipe ini menghasilkan dan membuat mesin yang menggunakan tenaga listrik sebagai pemacu utama dan untuk menghasilkan motor. Selain itu, ia tidak memerlukan banyak tenaga manusia. Projek ini sesuai untuk digunakan dalam industri kecil dan sederhana (SMI) untuk memudahkan mereka menghasilkan Tebaloi. Kaedah untuk projek ini ialah mesin ini menggunakan pemampat sebagai mekanisme untuk menggulung kapi. Pulley kemudian gulung untuk melancarkan roller dan rata doh. Tujuan projek ini adalah untuk merekabentuk dan membina Tebaloi Rolling Machine yang boleh digunakan untuk usahawan cookies tradisional. Pada akhir projek ini, kami berharap mesin ini dapat mengurangkan pengeluaran Tebaloi.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The project design that our group would like to create is Tebaloi Rolling Machine. This project ranged to ease the manufacturing and applied in traditional cookies making industry on a small scale at home. This idea came about after seeing the difficulties in small business to make traditional flour-based cookies to be marketed in large quantities at a time using existing methods.

Besides that, the method of manufacturing processes based dough available at present, thry have to rolls using hand to get the desired size or thickness of the dough. This method takes quite a long time and the use of human labor is high. It also requires more observation and manufacturing process is quite difficult.

Through this project, it will help small businesses in their products in a systematic manner, does not require a lot of observation can be operated by an operator of a machine, can produce large quantities of Tebaloi in a time and reducing manufacturing costs. Moreover, by using this project, it does not pollute the environment.

During the progress of making this project, various types of machines have been developed to fulfill the needs of humans for the local and international markets. Although the costs of manufacture the machine can reach hundreds of ringgit, the advantages of the machine are the factor that attracts the user in the future.

Each machine is manufactured to fulfill the desire of human needs while giving confidence to the user for the security and safety features available on the machine and functions during operation.

As far as we can see, there is so much machines that have been developed and marketed, from there it gives us the inspiration to use the electric motor and it is named as Tebaloi Rolling Machine. This is because the making of traditional cookies in this country is marketable. Based on the physical properties that the dough has which is easy to be shape, this machine is very suitable for making of Tebaloi. With the innovation of this idea, it can reduce the cost of this Tebaloi expenses and it can save precious time at the same time reduced manpower.

This Tebaloi Machine is designed with 26 rpm powerful electric motor. It is designed to flat the dough using the roller. Because of this, it can be used anywhere because the machine frame designed with light weight.

In the terms of quality, we are also emphasis the machine development, so that it can guarantee satisfaction, comfort to every user that use the machine and fulfill users requirements. Moreover, resistance and durability of the machine can be maintained for long periods of time.

1.2 Problem statement

The outcomes method from existing method is not in systematic order. It is manpower only which process needs a lot of work energy and use bottle to roll the dough. It also takes time to roll the dough.

There is a one traditional method to make Tebaloi at this time, which is use glass bottle to roll the dough on banana leaves. This traditional method needs a lot of manpower to flat the dough on the banana leaves and at the same time can be exhausting. This method also needs to be observe whole time during process and it takes quite lot of time to take until the dough become flatten. Furthermore, its dough does not have fixed thickness

After done the research, our group has taken short moves to design concept a machine that is more practical and easy to manage for the small industry, without bringing any difficulties to them and an affordable machine. Besides respond to

governments to commercialize small and medium industries also traditional cookies to the eye of the world.

In order to enhance the production of this traditional cookie, the entrepreneur needs to be helped by providing advanced machines to facilitate the production work of their product.

1.3 Objectives

Generally, the objectives of our project are to make the process of making Tebaloi easier to be done compare to be traditional method. In this modern era, there is so many innovations and each innovation has its own objectives.

Our main objectives for this project are:

i. To build the Tebaloi rolling machine for Mukah's tebaloi factory.
ii. To flatten the tebaloi dough evenly from 2 to 4 mm thickness

1.4 Scope

This research involves the production of tebaloi with the dough product to be roll on the banana leaves automatically on the machine surfaces. The list show the scope of this project:

i. Can roll 5 to 6 tablespoons of dough in 25s for 2 laps
ii. Can roll 1 tablespoon of dough under 9s for 1 lap
iii. The dimension of this machine is 98x57x80cm
iv. The length and width for conveyor is 93cm long and 19cm wide

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

During this semester, many research and experiment was done to make sure the objective will achieve objective will achieve at the end of the project. Studies carried out to ensure the project meets the needs of user especially local tebaloi entrepreneurs.

A device or machine for flattening tebaloi is not existed yet but Dough Flattening device does. It can flatten dough to desired thickness. Normally, tebaloi flattening is using human power or traditional method to flatten and shape the tebaloi to desired thickness.

During the review of the project, we have used several methods of observation and study of this project. The study was conducted to identify the weaknesses in the product on the market and looking for improvement in order to meet the need of user and to facilitate the production Tebaloi Local Factory.

This study was based on sources such as internet, reference books and experience in the production Tebaloi. Resources sought were related to time consumption, cost of production , innovation, working principle and other features.

2.2 Tebaloi Production Method

Tebaloi usually made of flour mixed with various ingredients and flavoring. In addition to the flattening method, blending process consume time and require energy. This process is very tiring if done in not interrupt situation especially Tebaloi entrepreneurs

Figure 2.2.1 : Tebaloi Production Method

	Process 1 - Mixing Ingredient • Mix/Blend all the ingredient together until the dough is blended together
 	Process 2 - Flattening/'Meleceh' • The dough is prepare in a dough container • Spread the golden banana leaves • Put 2 scope of the dough on the leaves • Take a white plastic and the plastic on top of the dough • By using a glass bottle,flat the dough until it reached desired thickness
	Process 3 - Baking/Heating • The flatten dough is place inside the heating furnace

2.3 Time consumption

Time consumption is an important factor for local entrepreneur because some of their product are popular among the locals and tourists. Usually local entrepreneur use a lot of man power to overcome this but how long can this last? Normal fatigue can leads to carelessness.

Time Consumption Emphasized When Making Tebaloi

i. Blending/Mixing Of Dough

ii. - Blending/Mixing of dough takes time to process when the dough is needed in a large quantity. In the process of producing Tebaloi , some makers will be issued of using a blending/mixing machine to reduce time consumption but it is to expensive for local entrepreneur.

iii. Flattening

- When using traditional method for flattening tebaloi is quiet hard and consumed a lot of time if some maker are not expert in flattening tebaloi. Even the local entrepreneur have hard time to determine the thickness of tebaloi. Only the local elders entrepreneur know how to make it faster.

2.4 Introduction to Rolling Device / Machine At Market

There are many types of flattening device/machine available in the market with different design and different types of materials. Most stores sell rolling device/machine are too expensive and some require man power

Table 2.4.1 : Comparison between Manual Rolling Device/Machine At Market

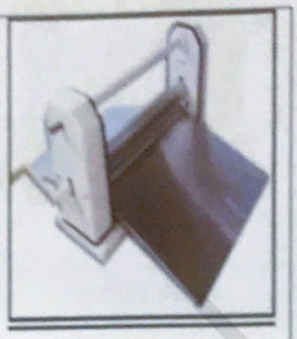
Items			
Made Of	-wood	-stainless steel	-stainless steel and mild steel
Weight	-100 grams	-300 gram	-2kg
Man power during flattening/rolling	Push and pull	Push and pull	Using a handle or crank to flatten dough
Operation	Using one hand	Using two hand	Using one hand
Difficulty	Medium	Medium	Easy
Price	Rm20-50	Rm30-50	Rm100-Rm250

Table 2.4.2 : Comparison Between Semi-Auto Rolling Machine At Market

Items			
Made of	-Mild steel	-Mild steel	-Mild steel
Size	-Medium	-Medium	-Large
No. Of Roller	-Three	-One	-Five
Price	Expensive	Expensive	Expensive
Weight	-Medium	-Heavy	-Heavy
Mechanism	-Dough is inserted in the machine slowly slide down while being flatten by two roller and one roller at the end	- Dough is slowly moving on the conveyor and being flatten at the middle of the machine and placed at small table in the end	-Dough move inside the machine just like a paper in a printer machine. The dough got flatten by five roller along the way
Time consumption	-moderate	-moderate	-fast

In this table, we can see that there are so many different types of roller device/machine with their own characteristics. This type of rolling is consume a lot of time and need man power during process and some of semi-auto machine have their own weakness especially on price and weight

2.5 Advantages And Disadvantages Of Device / Machine

Table 2.5.1 : Advantages and Disadvantages Of Manual Rolling Device

		
Advantages		
• Lightweight • Not expensive		
Disadvantages		
• Consume a lot of time • Can be tiring if continuously use • Need a lot of human energy		

Table 2.5.2 : Advantages And Disadvantages Of Semi-Auto Rolling Machine

		
Advantages		
• Use less man power • Less time consumption		
Disadvantages		
• Heavy • Expensive		

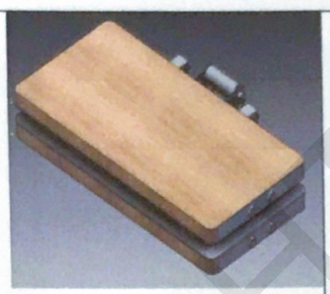
Rolling device/machine have advantages and disadvantages. But it have some disadvantages that can a be reliability toward local entrepreneur such as the price of the semi-auto machine while the manual cause a lot of time consumption and man power

Our project focus on automatic Tebaloi Rolling Machine, this compatible receiver with this theme (Controller) that help their to operate machine easily, continuously, not expensive, reduce time consumption and lesser man power

2.6 Introduction To Suggestion Design

Our group has created many type of design (2 main design) to change tebaloi rolling or flattening machine from manual to semi automatic. We focus on tebaloi rolling machine that using conveyor system because it easy to use and reduce time consumption

Table 2.6.1 : Comparison Between Machine/Device That Was Design

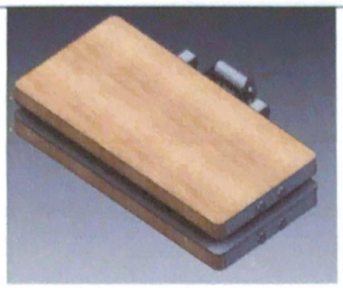
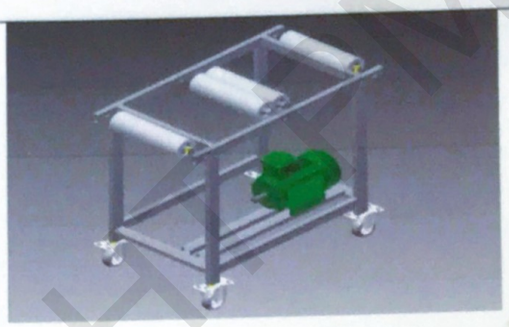
Items		
Size	(1x1x1)m cube	(0.9x1x0.5)m cube
Weight	light	heavy
Power Use And Sources	Pneumatic -	Motor Electric
Difficulty	Easy	Easy
Time Consumption	Moderate	Fast
Price	-	Moderate
Made Of	Wood Aluminum	Mild steel Stainless Steel

In this table, we can see that there are different types of Tebaloi Flattening Machine with their own characteristic. It was change from manual to semi automatic.

This will help to reduce man power and time consumption. Furthermore, the work can be done continuously without tiring user or Tebaloi entrepreneur

2.7 `Advantages And Disadvantages Of Tebaloi Rolling / Flattening Machine

Table 2.7.1 : Advantages And Disadvantages Of Tebaloi Rolling / Flattening Machine

 Design 1	 Design 2
ADVANTAGES	
• Dough flatten automatically • Reduce man power • Reduce time consumption • Easy to operate	
DISADVANTAGES	
• Heavy • Need electrical supply (design 2) • Wood can decay some time later (design 1)	

Tebaloi Rolling/Flattening machine that has been design still have disadvantages because we can make more advance design but it need more time, tools and consume high cost. Even though our project design have disadvantages, but still achieve our objective that reduce man power, reduce time consumption (faster production) and easy to operate machine

CHAPTER 3

METHADOLOGY

3.1 Introduction

Methodology is a way to identified how the project can be conducted from early stage until the presentation process. In this chapter, we can also discuss about the aspects about the project conduction method so that it can be understand clearly whether during assembly or applications. Safety factor is also important to make sure that implementation of the project will be complied.

3.2 Project Design Of Specification

Earlier study by the methods that use in traditional tebaloi flattening process in Mukah Tebaloi Factory. Every product reviewed has different specifications from the design, size and safety.

3.2.1 Design Concept

A design should have its own concept to cater all the required users. Design concepts are produced to add new technology. Besides, it is also used for selecting the best design among the ideas.

3.2.2 Initial concept

Design should meet the characteristics and objectives to be achieved. The beginning of the process start with the literature review and feasibility studies to facilitate the design process. The weaknesses and problem have been analysed to replace the traditional process for rolling tebaloi.

3.2.3 Design concept

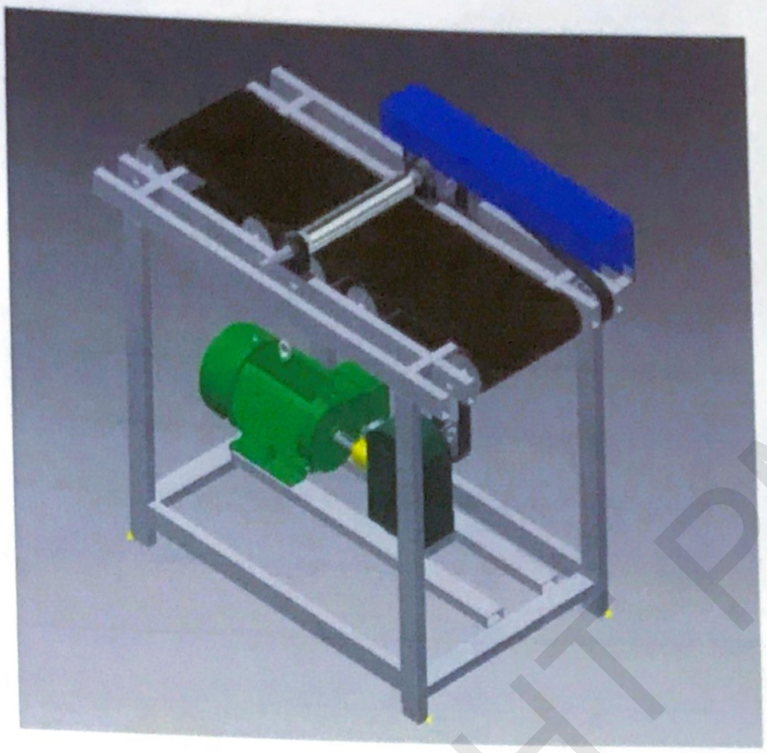


Figure 3.2.3.1 : Design Concept

3.3 Work Flow Chart

The flow chart provided the guide line and reference to facilitate the work to be carried out. This allows us to work easily and accurately according to the specifications that had been set on a sample process flow chart as shown on the 'Flow Chart 3.2,'.

The purpose of the work flow chart was created to guide the customer to know and understand about the process of starting from the beginning to the end of the project done. It explains in detail about the work flow chart.

There is scope to elaborate on the flow process and procedures to guide the work. Project implementation according to the flow chart of the work in the framework as shown is bottom:-

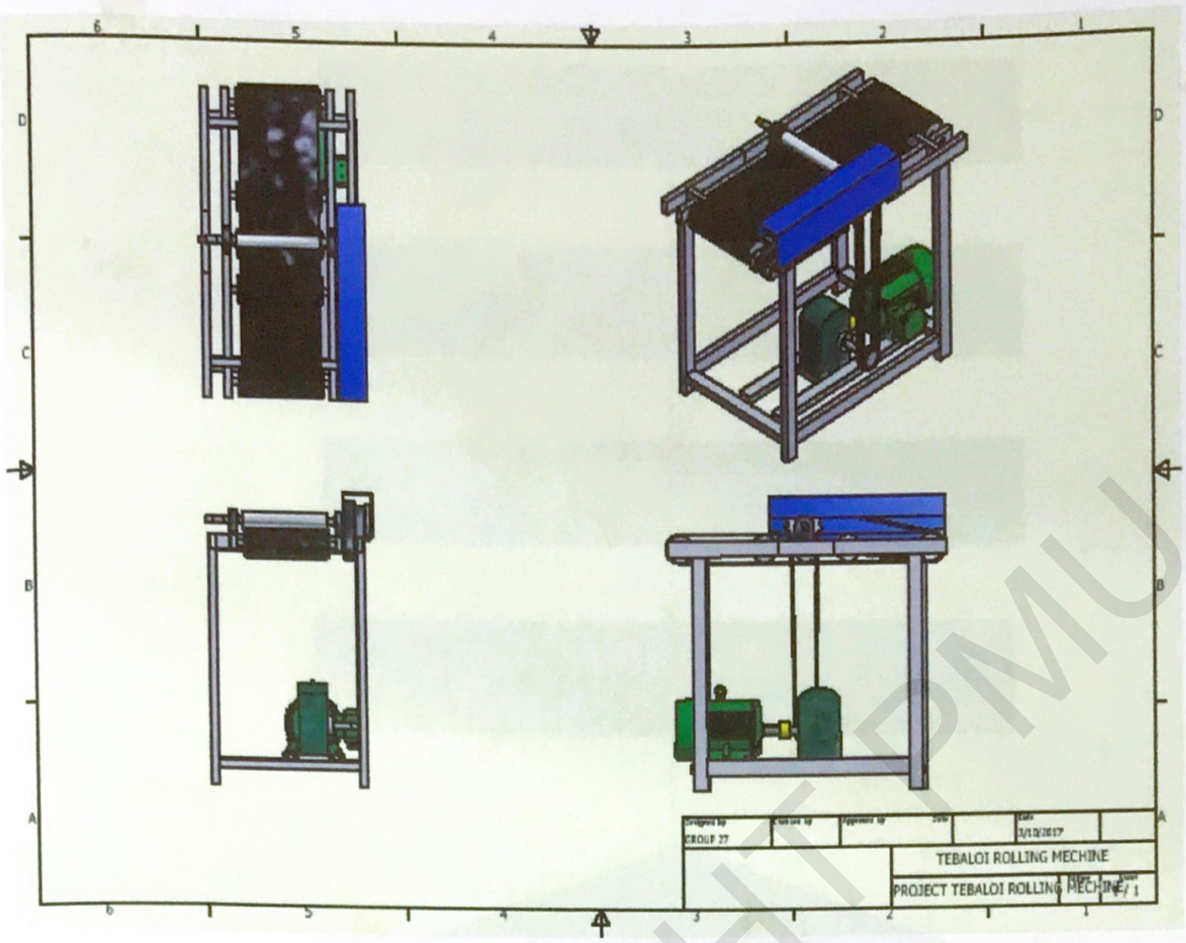


Figure 3.2.3.2: Design Orthographic View

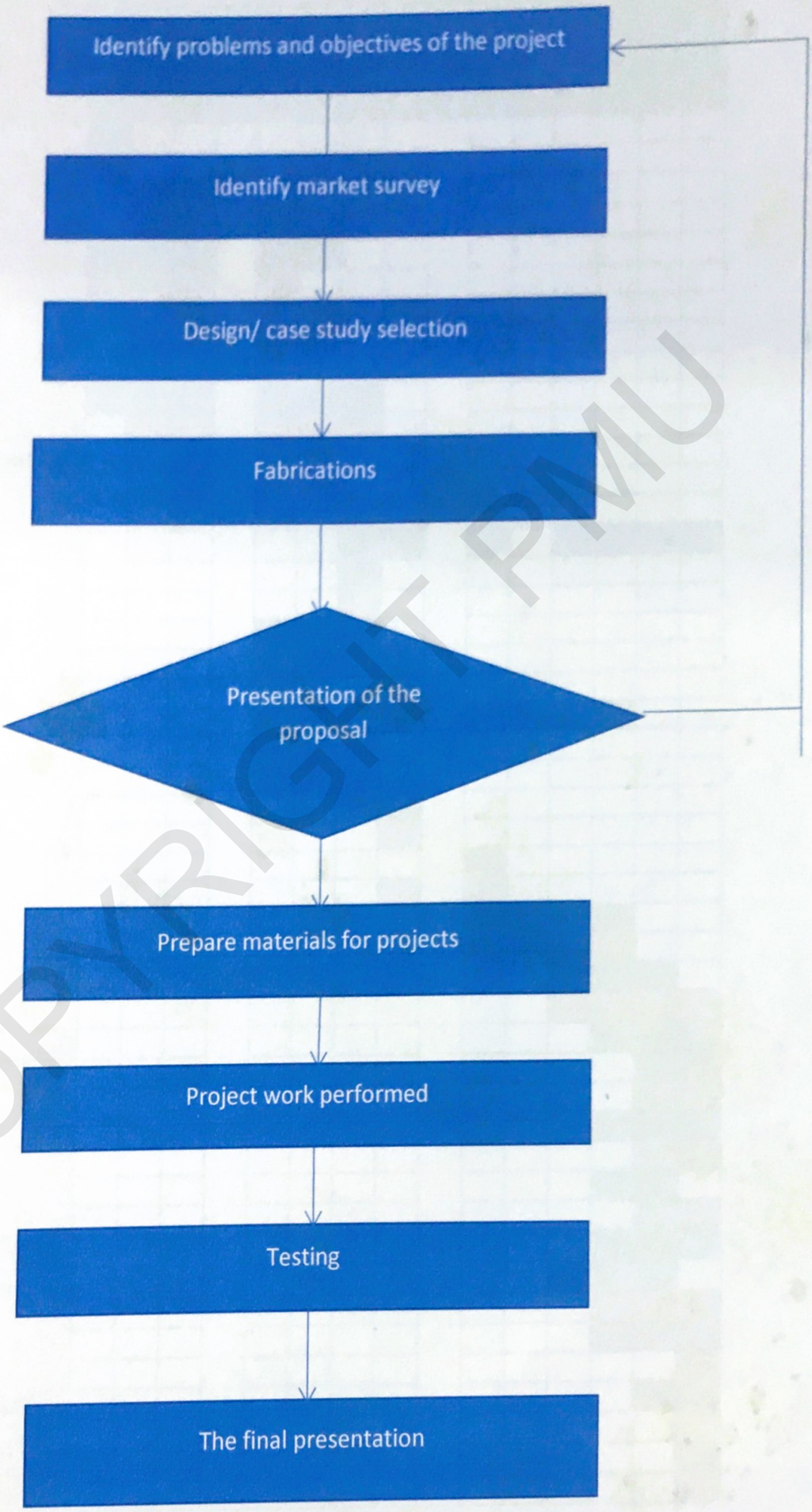
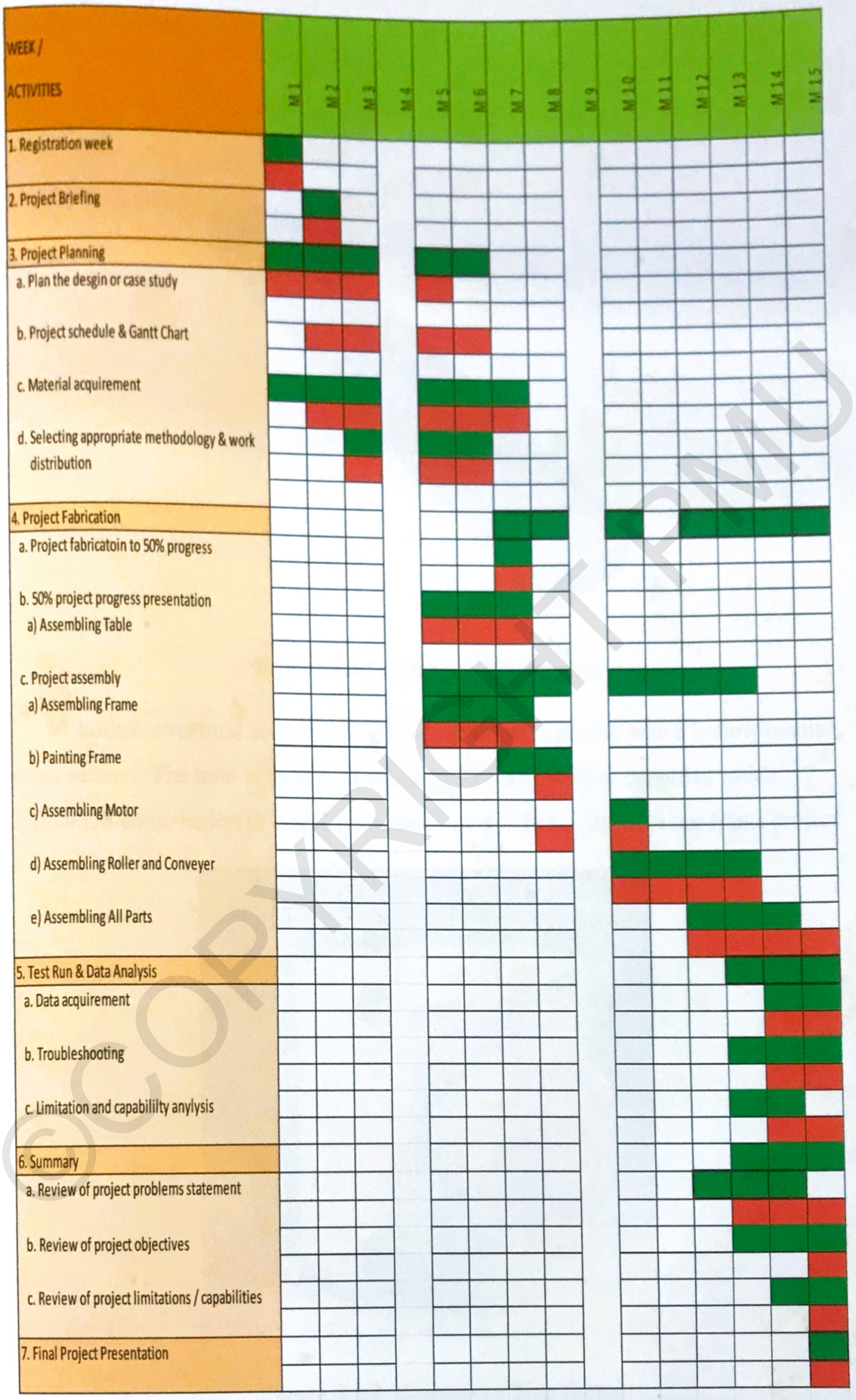


Figure 3.3.1: Project Flow Chart



note:

	planning
	actual

3.4 Part Selection

Figure 3.4.1: Rectangle Hollow Bar

A hollow structural section (HSS) is a type of metal profile with a hollow tubular cross section. The term is used predominantly in USA, or other countries which follow US construction or engineering terminology. This is used for our frame project.

Figure 3.4.2: Emergency Stop Button

Emergency stop button is a safety mechanism used to shut off a device or machinery in an emergency situation in which it cannot be shut down in the usual

manner. A kill switch button is designed and configured to completely and as quickly as possible abort the operation. Kill switch is usually designed so as to be obvious even to an untrained operator or a bystander.

Figure 3.4.3: Electric motor

An electric motor is an electric machine that converts electrical energy into mechanical energy. The reverse of this is the conversion of mechanical energy into electrical energy and is done by an electric generator and generators and motors have much in common.

Figure 3.4.4: Pulley

A pulley is a wheel on an axle or shaft that is designed to support movement and change of direction of a taut cable. A pulley may also be called a sheave or drum and may have a groove or grooves between to flanges around its circumference. The drive

element of a pulley system can be a rope, cable, belt, or chain that runs over the pulley inside the groove or growers.

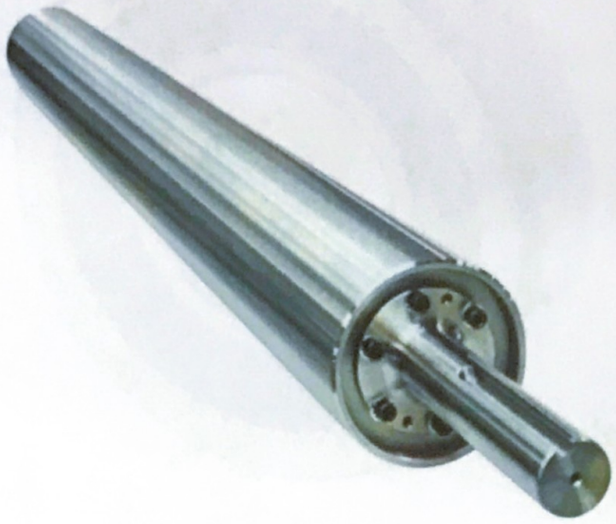


Figure 3.4.5: Roller

Roller is a cylinder that rotates around the central axis and is used in various machines and devices to move, flatten, or spread something.

Figure 3.4.6: Belt

A belt is a loop of flexible material used to link two or more rotating shafts mechanically, most often parallel. Belts may be as a source of motion, to transmit power efficiently, or track relative movement. Belts are looped over pulleys and may have twist between the pulleys, and the shafts need not be parallel.

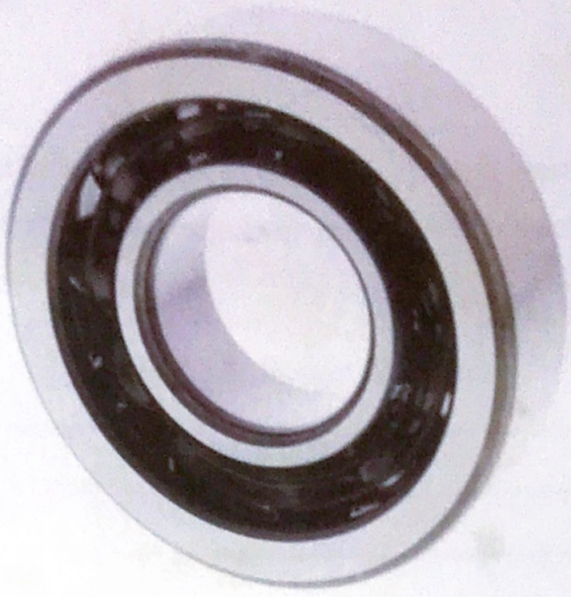


Figure 3.4.7: Bearing

A bearing is a machine element that constrains relative motion to only the desired motion, and reduces friction between moving parts. Most bearing facilitate the desired motion by minimizing friction.

Figure 3.4.8: Conveyor belt

A conveyor belt is the carrying medium of a belt conveyor system. A belt conveyer system consists of two or more pulleys, with an endless loop of carrying medium. One or both of the pulleys are powered, moving the belt and the material on the belt forward. The powered pulley is called the drive pulley while the unpowered pulley is called idler pulley.

3.5 Budget Of Project

In creating a project, the financial factor is important mainly produce machines that are reasonable and affordable, especially small-medium enterprises. The table show the actual costs for this project.

Table 3.5.1: Budget of Project

ITEM	QUANTITY	PRICE(RM)
Motor and reducer	1	588.95
Taiyo worm gear box	1	47.70
Vee pulley	4	100.88
Mild steel hollow Mild steel tube 48 x 58 s/s plate	1	260
On off switch	1	28
Emergency stop button	1	22
Twin wire	7	7.70
Bearing	4	32
Spray paint – silver -	1	8
High tensile bolt	4	16.20
High tensile nut	4	4.80
belt	2	45
Swivel Caster Wheel	4	32
Bearing holder	6	100
Metal glue	2	22

3.6 Weekly Activities

During the process of implementation of this project, a record of the work done has been done on a weekly basis. This thing made so the work yet to be made can be identified accurately. The records during the weeks also help saving time by the plan activities that will be undertaken in the coming week.

Table 3.6.1: Weekly Activities Project

WEEK	ACTIVITY
1	Choosing and bought the right material for frame and surfaces of the project.
2	Fabricate metal. Measuring and cutting the metal to desired length and angle.
3	Fabricate metal. Measuring and cutting the metal to desired length and angle.
4	Changing design from pressing to rolling process. Doing research from internet and past project.
5	Cutting and weld metal for new design.
6	Continued with welding process for the body frame.
7	Assembling and test run the electric motor. Drilling body frame for assembling motor and reducer.
8	Painting body frame.
10	Assembling roller for conveyor. Fabricate shaft for roller.
11	Sew conveyor belt to increase durability. Welding 2 bearing holder at the top of the body frame. Cutting 2 part of body frame to make pulley and roller adjustable.
12	Customize 2 bearing holder by welding 2 shaft at the top and bottom. Welding the bearing holder at the body frame.
13	Welding shaft at stainless steel roller pin with mig welding. Assembling all parts. Test run.
14	Fix the problems after test run. Adding 1 more roller pin under the stainless steel roller pin. Fabricate cover for pulley and belt. Collect data and complete report, video, poster and template

3.7 Project Problem And Solution

While implementing the project, certainly there will be problems that arise and must be solved with the best way. Some problems arising from lack of experience and research. All issues were successfully controlled.

Table 3.7.1: Project Problem And Solution

PROBLEMS	SOLUTION
a) Hollow bar melt and caused holes during the welding.	Using MIG welding by tagging the body frame.
b) Changing design from pressing to rolling process during the fabrication week.	Doing research for rolling process from the internet and past projects.
c) Lack of MIG gas for welding process.	Using arc weld with appropriate current and volt

3.8 Conclusion

In conclusion, this project can be made with good planning such as project designed was reviewed before implementing. In addition, the length of time to make the project can be set correctly. Moreover, the cost to make this project can be planned in advance so that it does not cause financial problems during the implementation.

CHAPTER 4

PROJECT DESIGN

4.1 Introduction

In this Chapter, Tebaloi Rolling Machine was design by using Autodesk Inventor Professional. We using this software because it is easy to use and edit. A very part of this project was design and sketch, this process help to make sure suitable dimension for every put was create and any problem in this project can detect before fabrication process.

4.2 Completed Project Design

Figure 4.2.1 : Complete Project

4.3 Project Drawing Design (Autodesk)

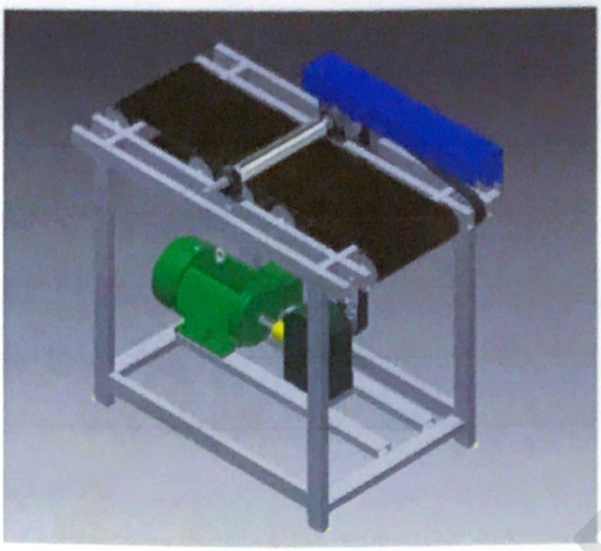


Figure 4.3.1 : Complete Project Design

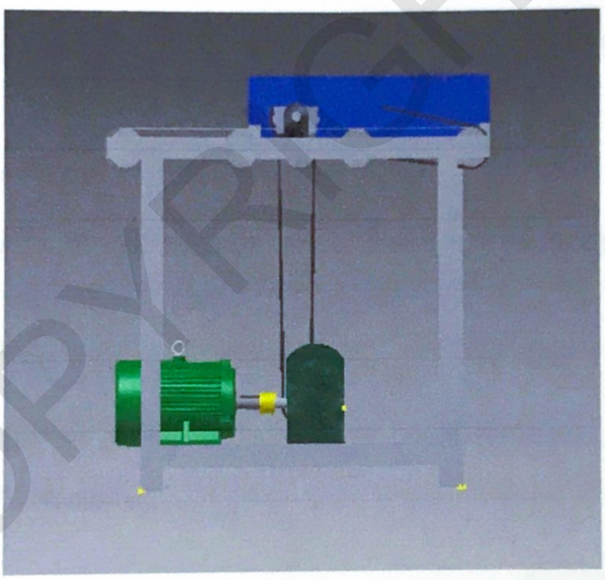


Figure 4.3.2 : Front Project Design

4.5 Assembly Parts Function

a) Motor Holder

- Motor holder was installed at body frame by using SMAW welding

b) Shaft

- Shaft was install at body frame for spare part such as roller to make place for belt.

c) Power window motor

- Power window motor was assembled by using bolt and nut at the plate holder to make sure shape at motor shaft connect with transmit shaft.

d) Body Frame

- Assembly motor and roller at body frame using SMAW welding.

e) Swivel Caster Wheel

- Assembly swivel caster wheel at lower body that can move easily.

f) Roller

- Assembly at body Frame at end of body frame and two at middle using SMAW Welding.

g) Belt

- Assembly at middle of body frame using welding.

4.5 Project Development

Implementation of manufacturing jobs and module design requires planning with good development. This project done by using suitable development method and procedure to complete the project design until the project done.

4.5.1 Project Development Process

To develop this project, there are several step and method to make sure this Tebaloi rolling machine done with success.

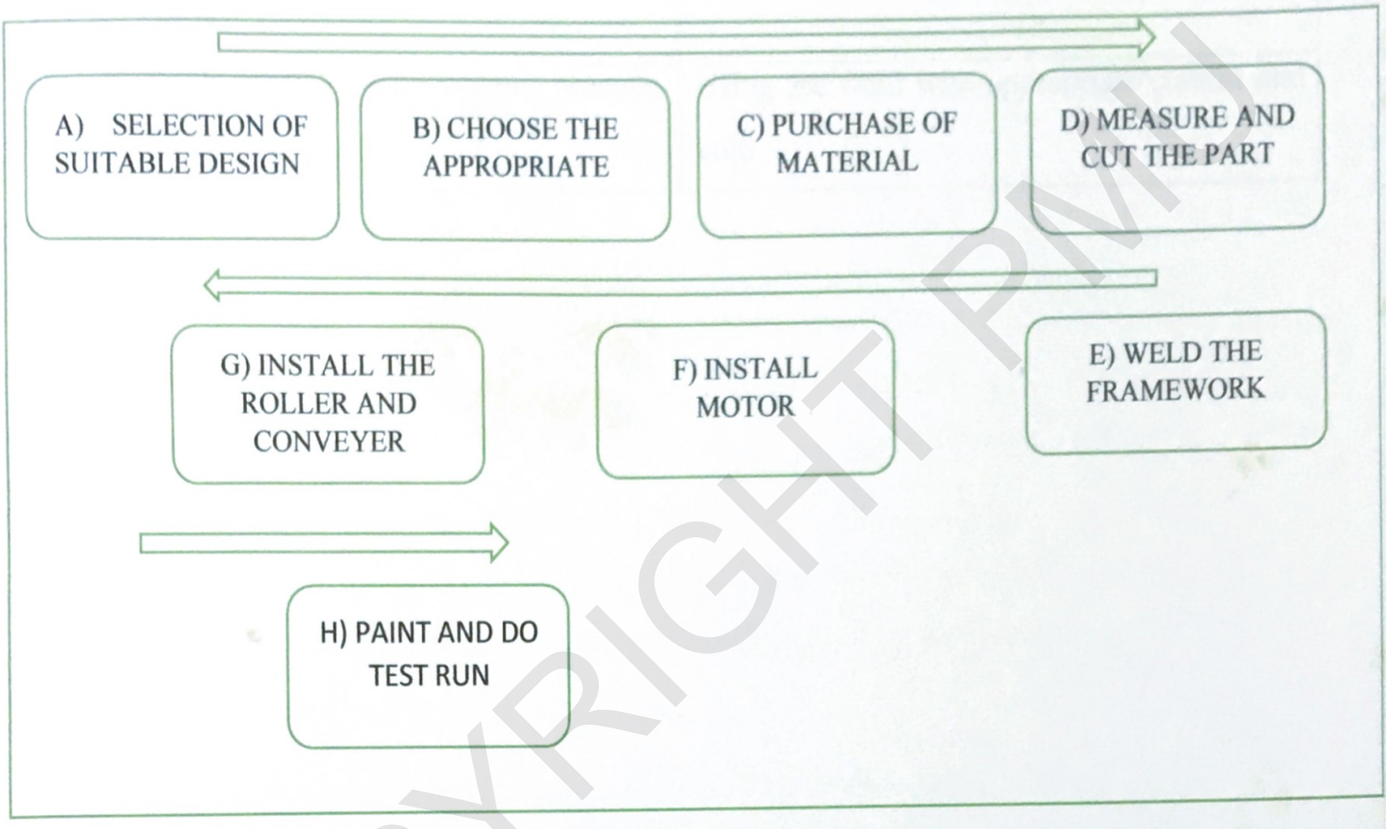


Figure 4.5.1 : Project Development Process

4.6 Project Problem and Solution

While implementing the project, there are always problems that arise and must be solved with the best some problem arising from lack of experience and research. All issues were successfully controlled.

Table 4.6.1 : Show Project Problem and Solution

PROBLEM	SOLUTION
a) Hollow bar melt and caused holes during the welding.	Using MIG welding by tagging the body frame.
b) Changing design from pressing to rolling process during the fabrication week.	Doing research for rolling process from the internet and past project.
c) Lack of MIG gas for welding process.	Using arc weld with appropriate current and volt.

CHAPTER 5

SYSTEM IMPLEMENTATION/PROJECT RESULT

5.1 Introduction

After conducting a few researches , our group had done a few analysis and data regarding our project which is Tebaloi Rolling Machine. Based on analysis, there were several disadvantages found on traditional method and present day rolling machine. A good examination of research and analysis need to be carried out in order to produce a good and potential machine that can be placed in the market. Moreover with a good cooperation between group members, we can produce a good quality machine which can help tebaloi entrepreneurs in their product.

Our group also had decided to reduce the problems by the existing rolling machine into a machine that is for flattening tebaloi dough into desire thickness, easy and do not burden the entrepreneurs or worker. All this aspect had become our objectives and decreasing the cost in making the tebaloi rolling machine. Furthermore our machine had an induction motor which connected to a speed reducer with it shaft installed with a pulley later than connected to two more pulley to move the conveyor and rolling pin thus removing the use of human energy to flatten tebaloi dough to desired thickness.

5.2 Description Of Results Of Analysis And Data

5.2.1 Novelty and Creativity

Before our group, there was no other group that have built this Tebaloi Rolling Machine. After reviewing the traditional method and existing rolling machine, we discuss among our group members and came out with a few modification concept. We used pulley and v-belts to move the conveyor and rolling pin. Next, we used corset as a conveyor which is cheap, easy to install and flexible . This creation is much simpler and required less cost.

5.2.2 Neatness and Durability

The neatness and durability of a project must be considered carefully in order to make it more standard and interesting. People will look up to the design and neatness of the product as well as its function, price and quality. Our machine is painted was to remove the rusty surfaces on our machine. Before applying paint, we grind and brush our project so it is free from rust and equally plain in order to maintain its neatness. Every joint of our project is welded carefully in order to maintain its balance and withstand the induction motor plus speed reducer.. Our project function well when equipped the pulley and v-belt.

5.2.3 Commercial Potential

Our machine is highly potential to be commercial especially at small, local or traditional tebaloi entrepreneur. In the previous chapter, we had stated that we choose

'Tebaloi Rolling Machine' title because we wanted to reduce human power while flattening the tebaloi dough to desire thickness. Thus this lead to our group's main objective that is to produce tebaloi rolling machine that operates using electrical motor. Furthermore, its low price makes our machine affordable and other factors such as low repairing cost and modification makes its potential to be comercial even for local or small entrepreneur to own it.

5.2.4 Safety Features

It is important to consider safety especially doing fabrication process. Each machine produced must be tested first to ensure the safety of consumer when using the machine. Users nowadays accentuate safety as their first priority when using a machine as this will affect the demand in market and people won't use it. For our project, we cover up our belting system with stainless metal sheet. Other than that we also grind off sharp edge end so there no injury occur when handling the side of the machine

5.2.5 Cost Suitability

Apart from suitability of material utilization, we also considered our cost suitability. We had reduced the amount of our cost so that it is affordable and can be owned by small or local entrepreneur. We have estimated the production cost to be under RM 950 and the price should be around RM 800 - RM 900 in market due to the cost for each material used have been limited and transportation cost is deducted.

5.2.6 Demonstration

After completing the assembly for our project, we had out a few tests run to ensure whether our machine is workable or not before doing demonstration. We used tebaloi dough that is bought at local entrepreneur. The test run is carried out with supervision from all of our group[members. The problems occur when conducting first test run which were the tebaloi dough is not flatten the way we wanted due to no roller under the rolling pin to flatten the tebaloi. This problem was solved since a roller is place underneath the rolling pin. Overall, our machine was functioning very well and in good condition although there is a little problem occur

5.3 Objective Achievement

We have plotted a objectives while doing this project which related to our discussion. The objectives are achieved. The objective are typed below complete with its explanation:

i. To build the tebaloi rolling machine for Mukah's tebaloi factory

ii. To flatten the tebaloi dough evenly from 2mm to 4mm thickness

The objective is achieved because we were able to make the machine. Plus the machine fully functional and easy to use. Thanks to our supervisor for giving us advise and idea concept for our project design. Special thanks to our fellow friend for lending us a hand in making this project including workshop supervisor for lending us using MIG welding.

a) To flatten the tebaloi dough evenly to 2 - 4 mm thickness

The objective is achieved because we were able to flatten the dough into approximately 2mm (minimum) and 3.5mm (maximum). Special thanks to the Pusat Pemprosesan Tebaloi Unit Peladang at Kampung Tutus Hilir, for giving us free tebaloi dough for test run and demonstration during presentation.

5.4 Application Of Theoretical Knowledge

While doing this project, we were able to apply the knowledge that we had learnt here at Polytechnic Mukah which is applicable to the implementation of this project. The subject that we had applied is:

a) Engineering Design

We apply the subject pulley and belting to determine the suitable system for our project and design the size and structure of the project. We also apply the application in using a bearing so it can move the shaft easily.

b) Mechanical Workshop Practice 3

We used arc welding or Shielded Metal Arc Welding (SMAW) and Metal Inert Gas Welding (MIG) and the safety process during welding including assembly. We used arc welding and MIG welding to weld the hollow metal making it become body frame. Plus we also weld 3 roller to shaft so it can be insert inside the bearing making roll properly including pulley that is welded to the shaft.

5.5 Test Run

We have done a few test run on our project before presenting it to the panels or judges. Below are the result of the test run:

a) First test run

i. The machine work well. The induction motor is in good condition. Shaft welded joint break.

ii. We used tebaloi dough but not have banana leaves, we used alternative that is we used plastic bag

iii. The conveyor keep sliding to the edge of the roller due to smooth surface of the roller

iv. The tebaloi dough was not flatten to desired thickness due to no roller under the rolling pin.

b) Second test run

i. A roller was added under the rolling so it can flatten the dough.

ii. The shaft was welded again. It rotate properly and making the system function smoothly

iii. Sand papers were glue on the roller surface. The conveyor maintain it position.

iv. The objective was achieved even though we do not use banana leaves under the dough. The dough is flatten to desired thickness

5.6 Test Run Result (DATA)

For our result and data, our method is by the number of lap and time taken for dough to be flatten into desired thickness. The table below show the result and data:

Table 5.6.1 : Show Project Result And Data

Tablespoon	Lap	Time Taken (s)	Thickness (mm)
1	1	9	2
2	1	10	2
3	2	19	3
4	2	25	3.5
5	2	25	3.5

From the result above we can conclude that it takes maximum 5-7 tablespoon of tebaloi dough to be flatten in 25-30 second per 2-3 laps. This show that this machine is useful for local entrepreneur making it easier for them to work and ease up their everyday work burden.

CHAPTER 6

CONCLUSION AND SUGGESTION

6.0 Conclusion

During our final project, we had completed our own Tebaloi Rolling machine on time. We also had achieved our main objective although we encounter many problems before. This final project exposed student to the actual working environment or real situation which makes student enchancing their skill on what they had learnt here at polytechnic. This final project also make student to become more confident mentally or physically on their skills in making project.

At the end of the project implementation, we had learnt various skills and knowledge. We were able to cooperate with each other, solve problem regarding our project and also enjoy doing work which can be apply only on real working environment. This final project was our first platform in working experience before becoming a successful engineer or technician in the near future.

Last but not least, we were grateful that we had experience many valuable lessons while doing final project. Through hardworking and also good time management, our project had been completed before deadline. By completing this final project, we were able to test our ability and also applying mechanical knowledge in which we had done successfully. Our hope is that this project may become our first contribution to the world before we go to the next step in achieving a good job in the future.

6.2 Suggestion

For the suggestion, our group had discussed among ourselves that this type of final project should be continued to be carry on for the juniors at polytechnic. Because of this project, we were able to cooperate with each other thus deepening or friendship. Student's also able to create or invent new project based on their idea based on the theme given to them. Besides that, student also able to make a proper report bed on the format given. By doing proper report, student will be able to make report if they work in the future without any problem. Moreover, this final project helps student to be more serious when doing task and instill confidence in them.

6.2.1 Institution Purposes

During the implementation process, our group had identified several problems occur at the workshop of Mechanical Engineering Department. One of it is the metal inner gas (MIG) had broken and don't have enough gas. This causes us to wait for the turn to use the good one while waiting for other to finish using it. We suggest that the department should ready full packages of hand tools, safety tools and also good condition of welding machine so that on the near future, student can use it without any problem and also can able to complete the project on time.

6.2.2 Future Researches Purposes

Our group would like to give a few suggestion for those who wanted to do a modification on our Tebaloi Rolling Machine project in the near future. After doing some discussion, the suggestions are as follow :

i. The shape of Tebaloi dough that have been compressed can be change to other shapes.

ii. Replace the roller bar with the new one so that it can compress more thickness.

iii. Paint the body frame when necessary to avoid from rusting.

iv. The power source can be change so that it will more or compressed faster.

6.3 Reference

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