

UNIVERSITI TEKNOLOGI MARA

**DEVELOPMENT OF
RICE WASHING MACHINE
(WARIMA)**

YUNUS BIN ISMAIL

Dissertation submitted in partial fulfillment
of the requirements for the degree of
Diploma
(Mechanical Engineering)

College of Engineering

Feb 2024

ABSTRACT

In this globalisation era, food's hygiene is the most important aspect before the food get cook or eaten by human. Before this, washing rice manually by hands was really a time-consuming and energy waste for human. However, rice washing machine at the restaurants are too big in size and seemly cannot fit into small countertop. As a result, having rice washing machine that is small and can wash the rice for at least 4 people is a win and allowing human to achieve the best productivity and food quality. To design a machine that is capable of handling food with smaller size, research must be made beforehand. The prototype of the machine has been successfully fabricated according to the design based on the Solidworks and the result was good. It functioned well without any failure. As conclusion, the prototype will gain more improvements based on the panel's comments and suggestions.

ACKNOWLEDGEMENT

Firstly, I wish to thank God for giving me the opportunity to embark on my diploma and for completing this long and challenging journey successfully. My gratitude and thanks go to my supervisor, Dr. Wan Muhammad Syahmi bin Wan Fauzi.

Finally, this dissertation is dedicated to my father and mother for the vision and determination to educate me. This piece of victory is dedicated to both of you. Alhamdulillah.

TABLE OF CONTENTS

	Page
CONFIRMATION BY SUPERVISOR	ii
AUTHOR’S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	xi
CHAPTER ONE: INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Objectives	2
1.4 Scope of Study	2
1.5 Significance of Study	3
CHAPTER TWO: LITERATURE REVIEW	4
2.1 Benchmarking/Comparison with Available Products	4
2.2 Review of Related Manufacturing Process	6
2.3 Patent and Intellectual Properties	8
2.4 Summary of Literature	11
CHAPTER THREE: METHODOLOGY	12
3.1 Overall Process Flow	12
3.2 Detail Drawing	13
3.2.1 Part Detail	13
3.2.2 Assembly Drawing	19
3.2.3 Exploded View	20

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

In Asian countries, rice occupies an important place in culinary traditions, cultural practices and daily lives of people in many Asian countries. It is not only a staple food but also a symbol of prosperity, harmony and good fortune. China continues to be the world's largest producer, growing a third of Asia's total at 29 million hectares. India produces almost a quarter at 43 million ha. Other leading rice-producing countries in Asia include Indonesia, Bangladesh, Vietnam, Thailand, Myanmar, the Philippines and Japan. The average yield in these countries ranges from 2.6 t ha⁻¹ to 6.5 t ha⁻¹ [1].

Unfortunately, to cook some rice, the preparing session does not come quite handy. Washing rice manually can be a common practice in many households, but there are a few potential problems occurs with this method. Washing rice by hand can cause irritation to hands and fingers, especially on washing a lot of rice or have pre-existing conditions such as arthritis. Also, washing rice manually is kind of energy waste and time-consumed [2].

The global market has acknowledged these problems cause by washing rice manually and now, there are rice washing machines. Rice washing machine can be the best tool to help users to have the best rice they can get. As the machine's purpose to execute all excess grains and dirty water after the wash. But, most of rice washing machine in the market are too big in size as the inventor main target is food and beverages businesses. Rice washing machine should come in medium and maybe small size so that it could fit in a small kitchen or limited countertop [3].

The aim of this project is to enhance the current design of rice washing machine. The design process will be conducted by referring to a standard engineering design process and the chosen concept will be rendered and modelled using SolidWorks. This machine will have a simple system and easy to operate with. A prototype will be fabricated as a proof of concept by the end of Final Year Project 2. By enhancing the rice washing machine, the use of it will provide ease to many people.