



**UNIVERSITI TEKNOLOGI MARA
CAWANGAN PASIR GUDANG**

**DEVELOPMENT OF A PROTOTYPE DURIAN AND COCOMUT OPENER
MACHINE**

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Abstract

The Malaysian food industry plays a significant role in the country's economy, but the average household and small businesses lack the machinery needed for efficient operations. Research suggests that building a machine specializing in fruit dehusking, particularly for hard-shelled fruits like Durians, Coconuts, and Jackfruits, would greatly benefit small businesses and households. Currently, dehusking these fruits is a labour-intensive and time-consuming task, sometimes requiring multiple people or specialized tools. Hiring specialists or purchasing expensive machinery adds to production costs. Existing machines on the market are not financially feasible for small businesses and require skilled operators. To address these challenges, a new project proposes a machine that combines mechanical machinery with small effective mechanisms. This machine, made of lightweight materials and utilizing a car jack and separating plier, would be affordable and easy to use for households and small businesses. The project aims to solve three main problem statements: the labour-intensive nature of dehusking hard-shelled fruits, the high cost of heavy-duty machinery and operators, and the environmental impact of polluting machinery. By providing an affordable and eco-friendly solution, the project aims to benefit small businesses and households across the country.

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Chapter 1: Introduction

1.1) Background of Study

The Malaysian food industry is the leading driving force of our country's economy, second only to our Palm Oil production exports. This is the main drive for our country's technological advancement and plenty heavy-duty machinery were made to help in growing our ever-advancing industries that lowers cost and human labour. This is true for all our major industries from farming to oil and gas extraction across the country. However, the average household lacks such machinery and heavily rely on manual labour that need change. Small local business would also need some machinery upgrades that would benefit in more net income.

Research states that the best way to help and improve in the effectiveness of conducting small businesses and be a great tool in everyday household is to build and fabricate a machine specialising in fruit dehusking/ opening especially hard-shelled fruits such as Durians, Coconuts, Jackfruits, etc. These fruits are laboursome task to dehusk/ open and sometime require 2 people to properly dehusks/ open or would need a tool to do so. This technique is not only time consuming; it is also ineffective and sometimes dangerous to those who are unskilled operating such task. Some business owners would pay extra to hire specialist to dehusks/ open these hard-shelled fruits. Thus, increasing unnecessary production cost that would have been spent on other infrastructure in the business. There are machines available in the market that would mitigate this problem, however it would only be commercially viable if the business is well off and has a large model to spend. Moreover, such machines would also need a skilled operator to make use of the machine. Eventually, making it a large financial jump for small business that are just starting out. By making a middle ground that combines machinery and the use of small yet effective mechanisms that would ease the shoulders of business owners, as well as family members, this project was born.

This project would utilise mechanical machinery from small manual human movement with force multipliers to dehusks/ open hard-shelled fruits as mentioned above. By creating and innovating on past designs, a machine capable to minimise labour to open these fruits would help small businesses and households in their endeavour to dehusk/ open fruits. Made with light weight metals, a car jack, and a separating plier as its main dehusking/ opening device, it a cheap and helpful machine to used in households and operated by small businesses.