

**UNIVERSITI TEKNOLOGI MARA**

**DESIGN AND FABRICATION  
OF A PLASTIC SHREDDING  
MACHINE**

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## **ABSTRACT**

This project focuses on recycling plastic wastes which plays an important role for the better future of human and the environment. Recycling plastic waste helps to promote sustainability, reduce environmental pollution, and create a more sustainable future for all. Plastic pollution is well known among the public as it leads to a lot of problems such as it is difficult to decompose, consumes a lot of space in garbage bins and dumps, and endanger life species. The aim of this project is to design and analysis a plastic shredding machine that shreds large plastic wastes especially plastic bottles and cups into small pieces that can later be reused to make other products. The methodologies involved in this project are literature review, design and fabrication of the shredding machine, and the testing of the machine's performance. The expected result is a plastic shredding machine that can reduce the size of plastic waste for the use of small scale recycling and education purpose. This machine will be easy to operate and solve plastic waste problems.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of Study

Plastic bottles and cups are containers made of plastic that are commonly used for packaging drinks, such as water, soda, and juice. Plastic bottles and cups are lightweight, convenient, and inexpensive to produce, which makes them a popular choice for consumers and manufacturers alike.

However, plastic bottles and cups contribute significantly to the plastic waste problem. Many plastic bottles and cups end up in landfills or oceans, where it can take hundreds of years to degrade. Additionally, plastic bottles and cups take up a lot of space in dumpsters and junkyards which can be inconvenient.

To address the plastic bottle cup problem, solutions such as individuals reduce their use of single-use plastic bottles and cup by using reusable water bottles, cups and other drink containers. If recycling facilities are not available, people may dispose of plastic bottles and cups in regular trash bins. Some people also burn up their used plastic bottles and cups as it is the easiest way to dispose of it. However, these solutions have limitations and consequences. Hence, there is a need for a plastic shredding machine as shredded plastics is easier to dispose and recycled rather than disposing and recycling raw plastic waste.

The aim of this project is to design and analysis a plastic shredding machine that can break down plastic bottles and cups into smaller pieces so that it can be recycled and reused to make other products. The machine will be reasonable and affordable. It will be easily operated and it is portable. The machine will be designed using SolidWorks 2021 and will fabricated as a proof of concept, analytical and finite element analysis of the critical parts shall be carried out.