

**UNIVERSITI TEKNOLOGI MARA**

**DEVELOPMENT OF HAND  
OPERATED BENDING MACHINE**

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## **ABSTRACT**

The hand-operated bending machine stands as a versatile tool for precision bending in metalworking applications. This abstract provides a concise overview of the machine's performance based on key criteria, including versatility, precision, safety, and user-friendliness. Evaluating the machine's ability to handle various materials and achieve uniform bends, the impact have been explored of its unique three-roller pyramid concept. The result shows that this project can bend some of the metal but for the thinner side only and depends on the material that being bend. Additionally, safety features and user controls are examined to ensure a secure and intuitive operation. The abstract concludes with a reflection on the machine's overall performance and its potential for further enhancements, positioning it as a valuable asset in the contemporary metal fabrication landscape.

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# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background of Study**

In the past few years, along with the rising investments in the industrial manufacturing sector, the adoption of automated machine tools has also increased considerably[1]. One of the machine tools that have been produced in is a metal bending machine. A bending machine is referred to as a machine that is primarily employed for the purpose of bending any required work piece to a specific degree or angle. It uses a variety of methods, such as rollers, dies, and guides, to shape the material into the desired form. The usage of this machine has been very helpful for the industries when forming or reconstructing the metal needed.

However, there are a few issues with this topic. For personal and light use, these commercial bending machines are rather expensive[2]. The automated bending machine in Malaysia is very expensive to buy for the usage of forming a metal. The average price in Malaysia is RM 4,000 – RM 100,000. Rather than that, the machine is also heavy and has high electrical power to operate. Automated bending machines are usually created to be big and heavy and not suitable for personal use. The usage of electricity is also very high and costs a lot of money just to operate the machine.

Based on the issues, hand operated bending machines are also widely produced in the world. The machine was also designed to be a smaller and lighter machine and very suitable for the small industries work. This machine also reduces the cost involved in concern and avoids electrical power usage.

Thus, there is needed to design a less-cost bending machine for personal use. The aim of this project is to develop a hand operated bending machine to avoid using the high-cost machine just for personal or light use operation. The bending machine will be cheaper, and less energy usage. The machine also uses a lightweight material for