CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

The industrial manufacturing industry is responsible for the fabrication of products intended for industrial use from raw materials; it is the output of this industry which has made further mass manufacturing possible in most other industries. It is responsible for producing a variety of different machinery, from huge industrial to simple household machines, as well as other industrial-use products such as hardware, paper and packaging materials, glass, and other fixtures. However, in spite of the huge range of products, they all have a common function: to eliminate or reduce the amount of human energy expenditure, or manpower, needed to complete the job. No matter what type of machinery is employed, it is crucial in producing many of the goods and services vital to any economy in a timely and cost-efficient manner.

In the past a lot of effort has been put to reducing the cycle time and speeding up the output rate whilst totally ignoring the change overtime from one product to another. This has lead to the Economic batch quantity Concept and has resulted in small batches appearing to be Uneconomical to run. Reducing Setup times can give the equivalent of huge increase in process speed. This is all achieved without detriment to the quality of the Product. The idea of a setup time reduction Plan is move towards SMED (Single Minute Exchange Die) or OTED (One Touch Exchange of Dies).
1.2 PROBLEM STATEMENT

Lean Production System is about constantly finding the most convenient solutions possible. It concerns everything from reducing or eliminating unnecessary waste to giving customers exactly what they want. The concept was introduced in Japan by Toyota. That is also where it was refined and tested. Today, decades later, the thoughts and ideas have spread all over the world to thousands of companies.

The major problem when operating a press machine is when the process of changing a die to a new one in order to produce other products. Now, the die changing process is taking too long to be completed. Much energy is used through the process of changing of die includes human and machine. Forklift is used to remove existing die on the machine and then lift the other die to put back into the press machine. Manpower then used to make sure the mold is in the right position. The workers had to use a lot of energy to move the mold to make sure it is in the required position. Here, too much time and energy has been wasted to complete the conversion process mold.

As such, a necessary tool to save time and labor during the conversion process of the dies. The main purpose of this project is to reduce the changeover time at a small press machine located at Manufacturing Engineering Laboratory by reducing or eliminating activities that do not provide benefits. So in this stage of project, a prototype of external preparation activities at small press machine will be produced before it goes to the next stage which is to produce the actual equipment.
1.3 PROJECT OBJECTIVE

The objective of this project is to design and fabricate good external preparation equipment for small press dies. Stamping machines that available in the FKP laboratory serve as inspiration to create a suitable table design so that the resulting design will be appropriate and to the machine and its environment in terms of size and dimensions. The size of the resulting prototype will be scaled down to a scale of 1:5. The design of Die T-Table will be drawn using CAD Software which is Catia V5 and the prototype will be produced using the Rapid Prototyping machine. Rapid prototyping is a group of techniques used to quickly fabricate a scale model of a physical part or assembly using three-dimensional computer aided design (CAD) data. Construction of the part or assembly is usually done using 3D printing technology. The first techniques for rapid prototyping became available in the late 1980s and were used to produce models and prototype parts. Today, they are used for a wide range of applications and are used to manufacture production-quality parts in relatively small numbers if desired without the typical unfavorable short-run economics.

1.4 PROJECT SCOPE

i. The small press machine 60 tonnes that are located at Manufacturing Engineering Laboratory.

ii. The project will be focused only on external preparation activities during the changing process of the dies.

iii. The main target of this project is designing and producing a prototype of external preparation equipment for small press dies.

1.5 OUTPUT EXPECTED FROM THE RESULT

i. Able to design the Die T-Table using CAD Software.

ii. Able to fabricate the prototype of Die T-Table