CHAPTER I

INTRODUCTION

1.1. Background

In the modern era, development in the life like as industry, technology, and human need is progressing very rapid. Every manufacture has must adapt customer demands who always increasing every day. The customer sometimes feel less satisfied to the products offered by producer. Therefore, the producer has must innovation to make the product of best quality and can be accept by customer.

Besides that, to make a product, the producer has must devise the design by the product where it product have must multifunction and can be used in the long time. Therefore, in the design the product also there the procedure and the step of design the product.

Production and manufacturing process in many kind of fields required to solve the problem above without put aside the health and safety, it's mean a user or operator does not harm himself while interacting and work with the machine. According the safety operational standard of user in this day only operate the machine with computerized machine without directly touching and interacting with the machine. So that operator's safety is assured.

In the devise the design, there are many software program have used to design the product. The product realization process can be roughly divided into two phases; design and manufacturing. The engineer usually use the computing program to design the product.

In the procedural of design product, there are some step who must known and also how to implementation the design product to the turning machine for make the machining process.

A *product* is something sold byan enterprise to its customers. *Product development* is the set of activities beginning with the perception of a market opportunity and ending in the production, sale, and delivery of a product.

Not only that, in the design the product producers also notice the precition of product and also the suitability the product in the design so the engineer has must notice the suitability of product.

The engineer also notice the two main aspect in the production. First, ***Design,*** the design function plays the lead role in defining the physical form of the product to best meet customer needs. In this context, the design function includes engineering design (mechanical, electrical, software, etc.) and industrial design (aestherics, ergonomics, user interfaces). Second, ***Manufacturing,*** the manufacturing function is primarily responsible for designing, operating, and/or coordinating the production system in order to produce the produce the product. Broadly defined, the manufacturing function also often includes purchasing, distribution, and installation. This collection of activities is sometimes called the *supply chain*.

In the experiment, there are some part who used in the everyday life. In terms of the axis type, there are some type of axis like as three axis part, four axis part, five axis part and six axis part. In the experiment, we will use of three axis part and four axis part.

Moreover, the CNC program also have the important roles. If the CNC program has mistaken, then the result will be not satisfactory and the product will be defective.

Therefore, the engineer has must prepare the something to begin the design the product and make the product in the CNC machine who known is turning machine.

The product can be called good if the product has designed right and also notice the quality and the suitability of CNC program in the make of product.

1.2. Problem Statement

In the experiment, we use the UG Siemens NX 10.0 to design the product and manufacture the part in the turning machine. In the UG NX program, there are many problem and solution who must be solved in order to can operate the program. UG NX program is a multi-platform software suite for computer-

aided design (CAD), computer-aided manufacturing (CAM), and computer-aided engineering (CAE). UG NX can be applied to a wide variety of industries, from aerospace and defense, automotive, and industrial equipment, to high tech, shipbuilding, consumer goods, plant design, consumer packaged goods, life sciences, architecture and construction, process power and petroleum, and services. Even coverage could be more comprehensive. Not only that, the engineer also notice the type of tools who be used in the CNC machine (turning machine).

1.3. Problem Limitations

To avoid problem expenditure is needed some of problem limitation so that can be more understandable by focusing on those problem. Those problem are:

1. Determine the design type of part.
2. The machine who be used in the machining process.
3. The type of tools to cutting the workpiece.
4. The software has used to design the part like as UG Siemens NX 10.0.
5. Determine the programs like G-code and how to revision the G-code.

1.4. Objective of the Research

The purpose of UG NX program is to study about how to design the product, design the programs, determine the type of manufacture and implemented in the turning machine and can make the product who will implementation to customer. Also we can explore the object of product who will be design and the process in the manufacture. Not only that, the goal of research is :

1. Known the design of product and implementation in the CNC program.
2. To known the type of tools to cutting the workpiece.
3. To known the general parameter of product.

1.5. The Goal of the Research

The goal of research are expected after the research are:

1. The result of design will be processed in the Manufacture and the tools also will be determined in the Manufacture.

2. The operation of turning machine more safety and effective by knowing the spindle speed and cutting depth to increased material removal rates.
3. Reduced trial and error testing interactions.
4. More understanding of using UG Siemens NX software system especially in the design and Manufacture process simulation.

1.6. Literature Review

There are some studies as the reference of this research. In the process of design and Manufacture, there are many types of cutting process done in different conditions. In such conditions along with the general requirements of the cutting tool, they need some unique properties. To achieve this properties the cutting tools are made up of different material. The material chosen for a particular application depends on the material to be machined, type of machining, quantity and quality of production.

Moreover, the software also have the important role in the design product. One of popular in the software design is UG Siemens NX. Siemens NX software is an integrated product design, engineering and manufacturing solution that helps you deliver better products faster and more efficiently.

NX provides key capabilities for fast, efficient and flexible product development:

1. Advanced solutions for conceptual design, 3D modeling and documentation.
2. Multi-discipline simulation for structural, motion, thermal, flow and multi-physics applications.
3. Complete part manufacturing solutions for tooling, machining and quality inspection

So, not only the CNC program who most important but also the software design. Actually, still many the software design which is often used but UG Siemens NX the software design who most representative in the design and Manufacture.