CHAPTER 1

INTRODUCTION

1.1 Project Background

In 21th century, the demand for industrial products is increase due to the global consumption growth. The dominant forces that were shaping modern society through the early part of the nineteenth century were feudalism, imperialism, regional power struggles, and the rise and fall of civilizations driven by basic science, arts, architecture and literature.

The late nineteenth century and the first half of the twentieth century and the first half of the century brought the world to the industrial age. The dominant forces that started to shape the world were mass production of industrial goods through efficient manufacturing. Once again, the forces that shaped the preindustrial era provided the basis for this new phase, but they no longer dominated it. The center of power started shifting to the regions and countries the excelled in developing and utilizing the dominant forces that were shaping the industrial world. A new line of demarcation emerged between the “industrialized” and the “non-industrialized” world.

Then the world entered a new era in the second half of twentieth century. There were long debates about what to call it. The “post –industrial” era was not descriptive enough, nor was it accurate. The world had not stopped being industrialized, and it still has not. The “service era” was not appealing because it gave the image of a society where, figuratively, everybody would be working in fast food restaurant. That was not the way the world was being shaped, and still is not. Of course, the new era was much

more than that. We had entered the technology era in which the world was being shaped by knowledge; the society was revolving around technology; and the center of power was, once again, shifting to those who were able to develop and manage the dominant forces that were shaping the world. Those dominant forces were technological know-how and capability.

From my research need to development software based evaluation system for assembly. Assembly is considered as the last stage of product design before it reaches in the market. However, the short life cycle of the product would result the assembled product lose the competition in the market. As a consequence computer based system need to develop for evaluating the design at the conceptual stage to increase the speed of the product development. The aim of this project is to develop a computer base system that integrates product design for evaluation system(s) techniques. The software that needs to be developing is **integrating the integrated effort flow analysis and Boothroyd DFA.**

1.1.1 Effort flow analysis

Part Count Reduction

Effort Flow Analysis recognized goal of design for assembly by part combination. Some of the many benefits of part count reduction are: a reduced number of assembly operations, reduced procurement costs, cycle time reduction, supply chain reduction and higher potential profits.

In previous work, force flow analysis, a new technique to map forces as they flow across interfaces in a product, was shown to be successful at systematically providing creative insights for part combination. These insights arise by highlighting components having no relative motion between them. Examples are provided for the redesign of a 'Quick Grip ™ Clamp' and a staple remover, both of which highlight a specific class of relative motion components.

Component combination is one DFA approach to improved assemblability. Component combination (or piece count reduction™) is the combination of once separate parts into a single piece, which decreases the number of parts that compose a product while maintaining the essential functionality of the product. This piece count reduction in many cases is the most effective means of improving assemblability. Fewer parts imply fewer operations, less handling, and quicker assembly. Piece count reduction can also have broader implications.

A set of guidelines for component combination

i. The part moves relative to all other parts already assembled during the normal operating mode of the final product
ii. The part must be of a different material than, or must be isolated from all other parts assembled
iii. The part must be separate from all other assembled parts, otherwise assembly, or parts meeting one of the above criteria would be prevented.