QUALITY IMPROVEMENT USING 5S CONCEPT IN MANUFACTURING INDUSTRY

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Quality Improvement Using 5S Concept In Manufacturing Industry

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By

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ABSTRACT

This thesis focuses on the quality improvement at WINCO Precision Engineering (WPE) a precision machining company for Panasonic's air conditioners, compressors and refrigerator equipments. The objective of this research is to identify the current Quality Management System (QMS) implemented in this company while carrying out their operation. From this, the current quality problems that the company face will also be identified and studied. As conclusion to this research, recommendations and solutions to the problem faced will be suggested to the company's management to improve the current quality system as well as increase efficiency.

This research only focuses on problem faced in the production section of the company. Only issues regarding to method of handling in quality will be address and none of the mechanical and machinery factor will be covered in this research. In order to gather and analyze the data related to the quality some of Statistical Quality Control (SQC) tools were used such as pareto chart, histogram, cause and effect diagram and control chart. In improving the quality related problem faced by the production section of the company, suggestions based on 5S quality concept will be used as an approach to solve the problems faced. All suggestions given to solve quality problem will be based on 5 quality pillars of 5S concept which is *seiri, seiton, seiso, shitsuke and seiketsu*.

DEDICATIONS

For My beloved family and friends

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LIST OF ABBREVIATIONS, SYMBOLS, SPECIALIZED NOMENCLATURE

QMS	-	Quality Management System
SQC	-	Statistical Quality Control
TQM	-	Total Quality Management
WPE	-	WINCO Precision Engineering
MM	-	Millimetre

CHAPTER I
INTRODUCTION

1.1 Story of quality and 5S concept

During the time of World War II, it virtually destroyed the production capability of Europe and Asia. On the contrary, the United States (U.S) production capability greatly expanded since their major emphasis was on quantity and not quality production. However, as poor as it was in quality, the U.S still produced the best in the world compared to other nations. In late 1940s, Dr. W. Edwards Deming, a U.S quality control expert began working with the Japanese and continued doing so periodically for several years.

The Japanese developed the quality circle concept during the early 1960 and 20 years later, the concept had expanded to more than a million organizations. At the same time, Dr. Genichi Taguchi, a Japanese quality expert, introduced new statistical concept that was invaluable in improving process and product quality. Due to this improvement, Japanese industry ultimately has developed in various technologies all over the world. Following in their footsteps, U.S made some drastic changes in strengthening their power in the global age. Example of their improvement is:-

Ford Motor Company decided to do things differently following the Japanese. From the beginning all the disciplines from design through assembly to

marketing came on stream in unison. All of the relevant disciplines therefore interacted and contributed from the beginning. The plant was modernized and Ford personnel visited assembly plants, manufacturing facilities, major suppliers. The Ford employee was also asked what they would like to see in a new car (Waterman, 1987).

Besides all kinds of quality improvement techniques developed, one of the most famous is the 5S concept developed by the Japanese. (Osada, 1991) developed the original concept of 5-S in the early 1980s. 5S is the acronym for five Japanese words. They are:-

(a) *Seiri*
(b) *Seiton*
(c) *Seiso*
(d) *Seiketsu*
(e) *Shitsuke*

Respectively, Osada refers to the 5Ss as the five keys to a total quality environment. The Japanese have been widely practicing 5-S technique and believe it can help in all aspects of life.

1.2 Background of the problem

Satisfying the customer, through making a good product is the main objective of every manufacturing company. In competition, company is not only to provide cost effective products but also good in quality as well, which satisfy the demand. Fail to check the level of their quality consistently will have a consequence on the continuation of the product. It is necessary for the company to have the suitable quality management methods that fits to the needs, types of product and its activities. This study is based on a case study in a manufacturing

company and will access the current quality management tool which is 5S method in achieving company objectives as well as recommended improvement if necessary.

1.3 Objective

There are a few objectives for this study. Those objectives are:

(a) To research on the currently used quality management system in the company
(b) To identify quality problems faced by company
(c) To use various methodology in analyzing causes of the identified problem
(d) To give suggestion improvement to solve the problem using 5S quality concepts

1.4 Scope

The scopes of this study are as follows:

(a) To study the current Quality Management System (QMS) applied in the WINCO Precision Engineering. This study will only focus on the production section of the company regarding to method used to monitor quality and not on any mechanical and machinery aspect such as machine maintenance.
(b) The product chosen for this research is crankshaft and only main crankshaft produced will be studied which is the R/Super crankshaft.
(c) Perform necessary analysis on the data and identify problems faced by company in the production section.
(d) Suggest improvement for top 3 critical problems by applying 5S concept.

1.5 Arrangement of this project

Chapter 1

This chapter gives an introduction to the project along with objectives and scope. Besides that, it also describes about background of quality and background of problem in the case study Company.

Chapter 2

This chapter presents the literature review on Total Quality Management (TQM), ISO system (previous and current) and 5S Quality Concept. Besides that it also describes about 5S Quality Concept with other Quality approaches.

Chapter 3

This chapter describes background of the company and description regarding to the company's production field.

Chapter 4

Description regarding to the methodology used in this project to analyze problem as well as methods that will be used in performing this study will be discussed in this chapter.

Chapter 5

This chapter will describe and display all results acquired from the research done at WINCO Precision Engineering. The data will be sorted out and arrange for analyzing process. Besides that analysis will be done on the data acquired to identify root cause of each problem. Then improvement for each problem will be done using 5S methodology. This will be analyzed stage by stage by using the five different key elements in 5S concept which is *seiri*, *seiton, seiso, seiketsu,* and *shitsuke*.

Chapter 6

This chapter presents the conclusions of the whole project and suggestion as well as suggestions for future study.

CHAPTER II
LITERATURE STUDY

2.1 Introduction

This chapter will describe topics related to quality such as Total Quality Management, 5S methodology, ISO 9000 and Lean manufacturing. This chapter will begin with definitions of quality by quality gurus and an introduction and implementation of Total Quality Management (TQM). Next is followed by 5S methodology and a comparison of 5S with other quality approaches.

2.2 Definitions of quality

In the Webster's New World Dictionary quality is defined as physical or nonphysical characteristic that constitutes the basic nature of a thing or is one of its distinguishing features. Shewhart, said that there are two common aspects of quality, one of these has to do with the consideration of the quality of a thing as an objective reality independent of the existing of man. The other has to do with what we think, feel or sense as a result of the objective reality. This subjective side of quality is closely linked to value. It is convenient to think of all matters related to quality of manufactured product in terms of these three functions of specification, production and inspection. (Grant and Leavenworth, 1988). Quality is fitness for use, (Juran, 1989). Quality is conformance to requirements

(Crosby, 1979) and quality should be aimed at the needs of the customer present and future (Deming,1986).

Feigenbaum said that quality is the total composite product and service characteristics of marketing, engineering, manufacture and maintenance through which he product and service in use will meet the expectations of the customer. Mizuno said that product quality encompasses those characteristics which the product most posses if it is to be used in the intended manner. Actually, quality can take many forms. All the definitions mentioned above can be classified into three types. They are quality of design, quality of conformance and quality of performance. Quality of design means that the product has been designed to successfully fill a consumer need, real or perceived. Quality of conformance refers to the manufacture of the product or the provision of the service that meets the specific requirements that set by customer. Lastly, quality of performance brings out the definitions that the product or service performance its intended function as identified by the customer.

As for Dr. W. Edwards Deming, well-known consultant and author on the subject of quality said, “quality as nonfaulty system. Dr. Deming stresses that quality efforts should be directed at the present and future needs of the customer. In other words, customers do not necessary know what they want until they have seen the product or received the service. Another definitions is from, Dr. Joseph M. Juran, in his book describes, quality as fitness for use. He discusses that quality as conformance to requirement and nonquality as nonconformance.