UNIVERSITI TEKNIKAL MALAYSIA MELAKA

PRODUCTIVITY IMPROVEMENT: THE IMPLEMENTATION OF 7QC TOOLS AT COMMUNICATION MANUFACTURING COMPANY

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Manufacturing Engineering (Manufacturing Management) with Honours.

by

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APPROVAL

This report is submitted to the Faculty of Manufacturing Engineering of UTEM as a partial fulfillment of the requirements for the degree of Bachelor of Manufacturing Engineering (Manufacturing Management) with Honours. The members of the supervisory committee are as follow:

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ABSTRACT

This project is aim on the implementation of quality tools for the productivity improvement at selected company. The project is focuses on the incoming inspections where many types of reject parts are faced. The project began with the literature review on the scholarly articles, books and other resources that related to the quality control issues. For the planning process of this project, the Gantt chart was created as a direction in making the flow complete successfully. The methodology of this project began with describe the major problem until the suggestion for improvement. To carry out all the information, the basic quality control tools which have seven tools were used to analyze the data. Lastly, the suggestion for improvement was suggested by done in analyze all data that collected.

ABSTRAK

Projek ini memfokuskan dalam perlaksanaan teknik-teknik yang berkualiti untuk meningkatkan produktiviti di syarikat yang dipilih. Fokus projek ini lebih kepada peringkat permulaan bagi menyemak produk dimana banyak jenis kerosakan yang dihadapi. Projek ini dimulakan dengan meninjau dan menganalisis segala teori yang terdapat di artikel-artikel, buku-buku dan sumber lain yang berkaitan dengan isu-isu untuk mengawal kualiti sesuatu produk. Bagi proses perancangan projek ini, pelan perancangan telah dibuat sebagai panduan bagi menyiapkan dengan jayanya. Segala perangkaan bermula dengan mencari masalah utama sehingga cadangan bagi pembaikan. Untuk menganalisi semua maklumat, teknik-teknik yang berkualiti iaitu tujuh cara telah digunakan untuk manganalisis data. Akhir sekali, segala cadangan untuk pembaikan disarankan setelah dianalisis dengan tujuan mengurangkan jumlah produk yang rosak di peringkat jabatan.

DEDICATION

This project is dedicated to my beloved family and all friends who provide the most supportive atmosphere instead of loving and caring.

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LIST OF ABBREVIATIONS

AQL	-	Acceptance Quality Level
ASQ	-	American Society of Quality
CPU	-	Computer Processing Unit
DVD-RW	-	Digital Video Disc Re-Writable
IPQ	-	Inspection Product Quality
LCL	-	Lower Control Limit
MESB	-	Multitone Electronic Sdn. Bhd.
PSM	-	Projek Sarjana Muda
QA	-	Quality Assurance
QC	-	Quality Control
REV.	-	Revision
RAM	-	Random Access Memory
RM	-	Ringgit Malaysia
RR	-	Reject Report
TQM	-	Total Quality Management
UCL	-	Upper Control Limit
7QC	-	Seven Quality Control
£	-	Pound Sterling

CHAPTER 1

INTRODUCTION

1.1   Introduction

This chapter discuss on project background where problem statement and introduction are stated. Objectives, scopes, challenges faced, significance of project and research methodology are also highlighted for carry out this project more vividly. Organization of the report has been drafted to assist in making this project working smoothly.

1.2   Project background

In 21st century, the demand for industrial products is increased 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 reindustrialize 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 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.

Nowadays, production control and quality control are aspects that strongly influence the competitiveness of organizations and continually demand managerial attention. The organizations have used the quality tools and techniques in order to enter the market place at the same time give them long terms dividends through productivity improvement. The quality tools and techniques have been similar for certain organizations that are succeeding in their market place. The organizations have identified the concept of quality in different ways ranging from perception of value (Feigenbaum, 1951) to conformance to requirements (Crosby, 1996), fitness to use (Juran *et al*, 1974) and finally to meeting customer's expectations (Parasuraman *et al*, 1985; Adis, 2003).

Many various industries have been succeed by implement Total Quality Management (TQM) which is a philosophy that emphasizes the attainment of customer satisfaction to provide a quality product, increase productivity and lower cost. It is the application of

quantitative methods and human resources to improve all the processes and exceed customer needs. Even than that, many organizations sent their employees go to quality's training as an investment in order to gained knowledge, skills and attitudes for make better culture and environment in work place.

1.3   Problem statements

All parts that supply to Multitone Electronics Sdn. Bhd. (MESB) must to follow the specifications and pass the Quality Assurance department before go through to production line for next processes. However, the department has faced a lot of defection problems from supplier either local or overseas (incoming). The inspector faced many reject of parts in order to accept or reject the batch. In this way quality to determine the causes of the quality problem, so that it can be prevented in the future.

Based on the higher reject of parts, its have increased the cost for re-work. Other than that, the operators have taken more time on re-work than actual work. Furthermore, the production's activity will slow because of waiting the parts and can't achieve the output. For overall, the Quality Assurance department has faced many types of reject such as scratches, stain mark, white dot/stain, adhesive glue, poor coating, and many more.

1.4   Objectives of the Project

The objectives of this project are:

1.4.1   To study and understand the 7QC tools for inspection tools.

1.4.2   To implement the 7QC tools at selected company.

1.4.3   To measure the effectiveness of 7QC tools implementation at Quality department.

1.5 Scope of the Project

1.5.1 The project is mainly aimed on quality control which is related to the productivity improvement.

1.5.2 The project is focused on incoming's reject parts at Quality Assurance department.

1.5.3 The project is carried out using 7QC tools for determine the root causes of reject for Window R750R Display Silver and Window TLA ST1 New Multitone

1.5.4 The project is used one or two of 7QC tools as improvement in implementation stage in order to achieve the objectives.

1.6 Challenges faced

All organizations have various problems that must be solved immediately to eliminate waste. It is because; many organizations have their own confidential data to make them succeed in market place. Same with MESB, the data that will take must due to company policy to avoid anything happen. Therefore, it must have a permission from person-in-charge in order to complete this project successfully.

Nowadays, most of companies had implemented quality tools and techniques to solve their problems in quality side. This tools and techniques also take as knowledge that all their employees must have it to make quality life in organization and also to increase the productivity. But, most of them that implemented 7QC tools for their data which is confidential. So that, it's a bit complicate to find any information about examples of 7QC tools implementation in organizations.

1.7 Significance of the Project

The significance of the project show by the following parties:

    (a) Factory employer

This project may help the factory employer to improve productivity of production line by decrease their defection problems in quality side. Other than that, the company also can measure the supplier performance in order to be together on solving problems that faced.

(b) Factory workers

This project may help workers more awareness about defection problems on incoming parts and outgoing products. As result, the productivity will improve on quality problems.

(c) Student

This project helps students gain knowledge on quality control based on real situation in working place. The student also had learned to use analytical tools such as 7 quality control tools to implement in real life. From the knowledge gained, it is very useful for the student be able use it on working life.

1.8   Research Methodology

This project start with propose the case study and selection of company that related to the title. Then, the problem statements are identified to carry out the objectives and scopes of this project. Next step is finding all information about quality side as references and guideline in order to understand and measure the effectiveness tools that are use in final stage. All the information will be summarize to show the result on making the decision for quality tools and techniques that will be use in solving level. The Gantt chart is shown as guideline to make sure this project planning process going smoothly. This is the research methodology that used to perform a particular activity and also to select suitable methods for this project finish on time. Finally, detail information about methodology will carry out in Chapter 3, Methodology.

1.9 Organization of the Project

This report consists of six chapters which are introduction, literature review, methodology, company background, result and discussion, and conclusion and recommendations. Each chapter has all information that related to this project and it's described as below:

Chapter 1, explain the background of project, the problems statement that identify, objectives of project, the scopes and limitations, challenges that faced to done this project, suitable methodology that will be use, and organization of the project's report.

Chapters 2, view about the theoretical concept of quality control and management that related to this project. Relationship between quality and productivity, and all information that carry out from journals, books, articles, etc.

Chapter 3, describe details all methods that used to make sure this project planning going smoothly. All procedures to make an improvements related to quality are explained specify in order to done this project for both PSM 1 and PSM 2.

Chapter 4, describe details about all data that have analyze to get the result of implementation in this project. The route causes of reject part also highlight for improvement team that can use the information to take future action.

Chapter 5, present the whole of this project progress until done which is achieving the objectives or not to make conclusions and give recommendations that related for further research or study.

CHAPTER 2

LITERATURE REVIEW

2.1   Introduction

Quality is a very important to effectively competing in business-both manufacturing and services. It functions an important role in assuring the safety of consumers. Quality of life means that used term to bringing the concepts of quality into our personal lives. Some believe that quality is still the responsibility of the quality department rather than being the responsibility of everyone in the organization. Some believe that quality is simply avoiding doing things that will dissatisfy customers. Others believe that quality is a manufacturing concept with limited applicability to services. Whatever believing, quality is more than other concepts because the implementations of quality bring the improvement that will satisfy both organization and consumers (Richard Redmond *et al*., 2008)

Quality has been developed and implemented by many individuals and organizations around the world. This concepts has been accepted in order to make improvements and especially to increasing their profit probably. Quality concepts focus that top management had a need for systems to define material quality, work methods, and specifications and to control the processes that produced the parts.

For achieve the objectives of this project, all quality techniques and tools have been studied in order to identify suitable tool and technique. This is important and challenges part for getting information that related the quality control field.

2.2   What is Quality?

Nowadays, implemented quality represents the organizations are succeed in their market place. Therefore, how the organization makes their quality as their philosophy is very important thing depend on their problems and situations. Generally, quality has large definitions and many tools but it still give an improvement if implemented that.

The American Society of Quality (ASQ) defines quality as a subjective term for which each person has his or her own definition. In technical usage, quality can have two meanings: first, the characteristics of a product or service that bear on its ability to satisfy stated or implied needs and second, a product or service free of deficiencies (Quality Glossary, *Quality Progress* 35(7), 2002, 56.)

Shewhart suggested that quality has two aspects. The objective aspect refers to quality of a thing as "an objective reality independent of the existence of man". The subjective aspect refers to quality as "what we think, feels, or sense as a result of the objective reality". According to Shewart, although it is the objective aspect of quality that we usually attempt to measure, it is the subjective aspect of quality that is of commercial interest (Walter Shewhart, 1931). Furthermore, Deming, in his last book, *The New Economics for Industry, Government, Education*, agreed that quality is subjective and must have commercial value.

Joseph M. Juran defines quality as a composition of two different, through related concept: one form of quality is income-oriented, and consists of those features of products which meet customer needs and thereby produce income; in this sense, higher quality usually costs more and second form of quality is cost-oriented and consists of

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freedom from failures and deficiencies; in this sense, higher quality usually cost less (Rick Edgeman, 2002).

From Stewhart work, Juran also defined quality as "fitness for purpose or use" and Feigenbaum as "best for certain customer conditions" (Sower, 2008). Other than that, Parasuraram and others define quality as meeting or exceeding customer expectations (Sower, 2008). That mean they have same definitions which is put the quality to meet customers' needs and satisfy them in order to be order-winner successfully.

David Garvin has developed a list of eight dimensions of product quality to facilitate strategic quality analysis by breaking down the word quality into manageable parts so that management can define the quality niches in which to compete.

Table 2.1: Garvin's Eight Dimensions of Product Quality, (Garvin, D, 1987)

Dimension	Description	Example for Personal Computer
Performance	A product's primary operating characteristics.	Clock speed; RAM; hard drive size.
Features	Characteristics that supplement basic functioning.	Wireless mouse; flat-screen monitor; DVD-RW.
Reliability	Probability of a product malfunctioning within a specific time period.	Mean time between failures.
Conformance	The degree to which a product's design and operating characteristics meet established standards.	Underwriter Laboratories labeled; mouse, monitor, keyboard included with CPU.
Durability	Expected product life.	Time of technical obsolescence; rated life of monitor.
Serviceability	Speed, courtesy, competence and ease of repair.	Warranty conditions; availability of customer service and replacement parts.

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