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ZERO TOLERANCE IN PRODUCTION
FOR QUALITY IMPROVEMENT
AT COMPOSITE INDUSTRY

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**ZERO TOLERANCE IN PRODUCTION
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**ZERO TOLERANCE IN PRODUCTION
FOR QUALITY IMPROVEMENT AT COMPOSITE INDUSTRY**

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**Report submitted in fulfilment of the requirement for Bachelor of
Technology Management (Innovation Technology)**

**Faculty of Technology Management and Technopreneurship
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JUNE 2015

DECLARATION

“I declare that this project is the result of my own research except as cited in the references. The research project has not been for any degree and is not concurrently submitted in candidature of any other degree.”

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ABSTRACT

Zero Tolerance in Production for Quality Improvement at Composite Industry

Understanding and using management models, standards, and assessment tools, in conjunction with quality concepts and tools, can help ensure that businesses and other organizations survive and flourish over the long term. However, implementing a quality improvement stops short of managing a business from a strategic, systems perspective that can be accomplished using various management models, quality award criteria, and standards. Quality improvement is a quality trilogy which has several tools and technique that can be used to measure the level of quality. This research purpose is to study how to improve quality at composite industry. In the manufacture of composite products, they need to ensure that does not happen a lot of defects during the production process. The research is based on descriptive research design to conduct the research and use quantitative method because to collect data base on questionnaire. The research strategy by using study case and survey method will show how quality improvement which use the suitable quality concept can achieve zero tolerance in production. The aim of this project is to diagnose the quality improvement implement for composite product, then develop framework to successfully implementing. This paper presents the step-by-step application of the quality improvement methodology for reducing the rejection level of the fine grinding process. Several statistical tools and techniques were effectively utilized to make inferences during the project.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In order to manufacture a good product, the product must meet a standard quality, which existed before a product manufactured. The principle of quality are rotating around the philosophy that the success of a company is a function of how well the company satisfy or even exceed its customers' needs and wants, and continuously improve in the achievement of this result. According to Juran principle, he identified five factors that have been the major drive for improving quality. These forces that drove quality according to Juran include:

- *Greater complexity and precision of products*
- *Threats to human safety and health, and to the environment*
- *Government regulations of quality*
- *The rise of the consumerism movement*
- *Intensified international competition on quality*

(Joseph M. Juran, 1995)

Quality improvement is an important task in today's business activities that aims at customer satisfaction. Achieving a high quality product either enables a firm to differentiate its products or move close to product differentiation.

1.2 BACKGROUND OF STUDY

With customers yearning for continuous increase in quality and a corresponding decrease in price and delivery time, prevailing business strategies would always be unreliable to meet consumers' satisfaction. This obliges management of any firm who seeks to meet customers' needs to keep a watchful eye on windows of improvement. Since the enactment of quality improvement by its proponents other quality programs have been introduced which are separate quality improvement tools that were enacted in separate business era by different authors. Research has proven that most companies fail when implementing quality programs and some are afraid to initiate the implementation process. The aim of this research is to do a thorough literature review on what is the quality concept that suitable to use to improve quality. With the help of questionnaire, we will develop a roadmap that will leads to the culture necessary to breed successful implementation and sustainability of improvement programs.

The purpose of this research is to explain the nature of quality improvement and its relation to managing for quality, show how to establish quality improvement as a continuing process that goes on year after year, and define the action plan and the roles to be played, including those of upper management. As used here, "improvement" means the organized creation of beneficial change; the attainment of unprecedented levels of performance. A synonym is "breakthrough".

The quality improvement process rests on a base of certain fundamental concepts. For most companies and managers, annual quality improvement is not only a new responsibility, it is also a radical change in the style of management a change in company culture. Therefore, it is important to grasp the basic concepts before getting into the improvement process itself.

1.3 PROBLEM STATEMENT

The quality improvement program is expected to yield increased benefits. Studies have revealed that majority of these companies drop the program after the second or third year. What is sure is that minority of these companies benefit from the improvement but still keep the program for quite a short time as to what quality experts will recommend.

Composite industry probably one of that sector. As the manufacture of composite products, they need to ensure that does not happen a lot of defects during the production process. Quality programs that they are ready use right now is not enough because there are many defects in their production. Defects of composite products have a major impact on the company because to produce a composite product requires huge cost.

The composite industry, in quality management, its current issue for example published a survey of quality improvement indicating most of the companies trying to find an appropriate program to address quality problems. The composite magazine's analyst propounded a hypothesis saying by "Not tying improvement projects to corporate goals and/or not leading the improvement program initiative by top management almost guarantees the program will fail". How well this can become factual is part of this research.

Much cannot be done about the first point than sensitizing these companies about the need for continuous improvement. This research assumes its hypothesis on the last two senses to test its validity by seeking to optimize these functions and monitoring the outcome. The question now is; how can the management of improvement companies design and improve on quality programs' in line with the organizational goal to guarantee sustainable implementation?

1.4 RESEARCH QUESTION

In order to create a research, an iron triangle must be made to know the subject of what research is all about. Iron triangle is made up with three elements, which are the research topic, research questions and research objectives. In this section, the researcher would like to clarify more on the research questions and research objectives. The research questions are:

- i. What are the factor influencing quality improvement toward zero tolerance?
- ii. What are the relationship between quality factor and zero tolerance?
- iii. Which factor are more significant to zero tolerance?

1.5 RESEARCH OBJECTIVES

After the identification of the research questions, research objective need to build to help in answering the research questions and also as a guide for this research. The research objectives are:

- i. To study the factor influencing zero tolerance.
- ii. To study the relationship between quality factor and zero tolerance.
- iii. To study the prediction between factor and zero tolerance.

1.6 SCOPE OF THE RESEARCH

The scope of this research is to study the quality concept which are suitable for improve the quality of composite product at composite industry. There are many original quality gurus which has been trying to improve the quality on management, goods and services. A guru, by definition, is a good person, a wise person and a teacher. A quality guru should be all of these, plus have a concept and approach to quality within business that has made a major and lasting impact. The gurus mentioned in this section have done, and continue to do, that, in some cases, even after their death.

1.7 IMPORTANCE OF THE STUDY

The importance of this research is the researcher need find out a lot of concept about quality improvement. This concept will be used to make inquiries to identify which concept is more appropriate to improve composite production. Researcher also need had experience in composite field to ensure that this concept can be used in composite industry.

1.8 SUMMARY

The aim of this research is to diagnose the factor that influencing zero tolerance in production, then develop a road map to successfully implement the quality improvement.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter will present a quality concept with other literatures to give a clue on the implementing quality improvement. It will state a related theories with this research. This chapter also, will show a theoretical and operational framework which will be conducted by researchers.

2.2 ZERO TOLERANCE IN DESIGN AND PRODUCTION

A pioneering title, High Definition explores the onslaught of new and highly accurate digital metrology tools in large- and small-scale 3-D scanning and 3-D modelling. Capable of measuring space to an accuracy of less than 1 mm, these tools offer unprecedented precision for the development and interrogation of design before, during and post production. Over the last decade or so, the array of designers' digital tools to propose and make their ideas have evolved significantly, but the absence of high-accuracy, zero-tolerance design production has often remained the missing piece between design and fulfilment. Innovative technologies are thus substantially recalibrating the way that designers operate in the world between the drawn and the made, having the power to transform the architect's role from that of visualizer to one

that is intensely involved with the realisation of objects and buildings. High Definition will examine the capabilities of advanced technologies in design production through their impact on design theory, practice and greater levels of collaboration between design and manufacturing.

2.3 THE ORIGINAL QUALITY GURUS

2.3.1 W Edwards Deming

W Edwards Deming placed great importance and responsibility on management, at both the individual and company level, believing management to be responsible for 94% of quality problems (Deming, W. E., 1986). His fourteen point plan is a complete philosophy of management, which can be applied to small or large organisations in the public, private or service sectors:

1. Create constancy of purpose towards improvement of product and service
2. Adopt the new philosophy. We can no longer live with commonly accepted levels of delay, mistakes and defective workmanship
3. Cease dependence on mass inspection. Instead, require statistical evidence that quality is built in
4. End the practice of awarding business on the basis of price
5. Find problems. It is management's job to work continually on the system
6. Institute modern methods of training on the job
7. Institute modern methods of supervision of production workers, The responsibility of foremen must be changed from numbers to quality
8. Drive out fear, so that everyone may work effectively for the company
9. Break down barriers between departments
10. Eliminate numerical goals, posters and slogans for the workforce asking for new levels of productivity without providing methods

11. Eliminate work standards that prescribe numerical quotas
12. Remove barriers that stand between the hourly worker and their right to pride of workmanship
13. Institute a vigorous programme of education and retraining
14. Create a structure in top management that will push on the above points every day

He believed that adoption of, and action on, the fourteen points was a signal that management intended to stay in business (Deming, W. E., 1986). Deming also encouraged a systematic approach to problem solving and promoted the widely known Plan, Do, Check, Act (PDCA) cycle. The PDCA cycle is also known as the Deming cycle, although it was developed by a colleague of Deming as in Figure 2.1.

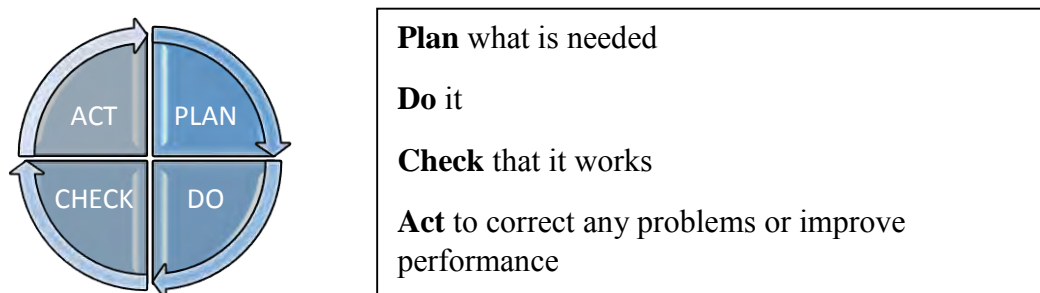


Figure 2.1: The PDCA cycle

It is a universal improvement methodology, the idea being to constantly improve, and thereby reduce the difference between the requirements of the customers and the performance of the process.

The cycle is about learning and ongoing improvement, learning what works and what does not in a systematic way; and the cycle repeats; after one cycle is complete, another is started.

2.3.2 Dr Joseph M Juran

Dr Joseph M Juran developed the quality trilogy – quality planning, quality control and quality improvement. Good quality management requires quality actions to be planned out, improved and controlled (Juran, J. M., 1995) as in Figure 2.2. The process achieves control at one level of quality performance, then plans are made to improve the performance on a project by project basis, using tools and techniques such as Pareto analysis. This activity eventually achieves breakthrough to an improved level, which is again controlled, to prevent any deterioration.

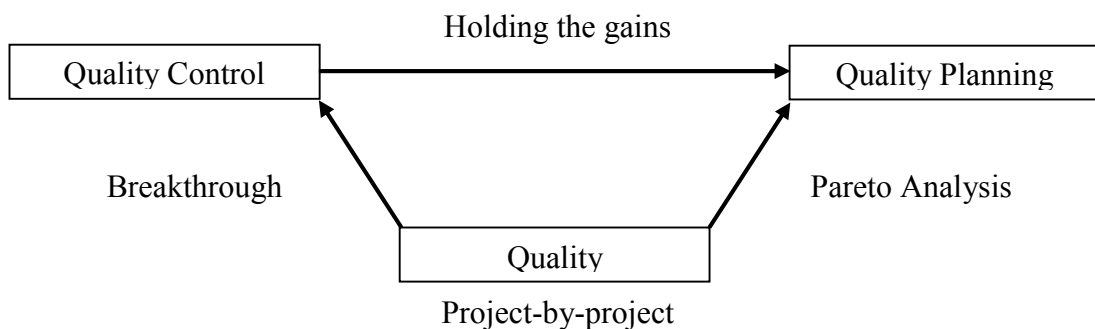


Figure 2.2: Quality Trilogy

Juran believed quality is associated with customer satisfaction and dissatisfaction with the product, and emphasised the necessity for ongoing quality improvement through a succession of small improvement projects carried out throughout the organisation (Juran, J. M., 1995). His ten steps to quality improvement are:

1. Build awareness of the need and opportunity for improvement
2. Set goals for improvement
3. Organise to reach the goals
4. Provide training
5. Carry out projects to solve problems