UNIVERSITI TEKNIKAL MALAYSIA MELAKA

A CASE STUDY OF KAIZEN IMPLEMENTATION IN SMI

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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ABSTRACT

Kaizen is a concept that focuses on improving a work area or an organization in incremental steps. Many organizations have begun to incorporate the philosophy of kaizen through the use of kaizen methodology. The first well-known and most frequently cited proponent of *kaizen* was Imai, who wrote *KAIZEN – The Key to Japan’s Competitive Success* (1986). He outlined the concept, its core values and principles, its relation to other concepts and the practices used in the improvement process. This paper illustrates about kaizen case study in Small Medium Industries (SMI) Company that is Micro Zass Sdn. Bhd. which produce machines spare part and food processing machines. The case study is focused on reducing lead time of sales order processing. Kaizen steps are used as guidelines and PDCA Cycle is chosen as problem solving approach to conduct the case study. The tools and techniques such as 5why, Work Instruction Sheet, Pareto diagram, Process Mapping, PDCA Cycle and brainstorming were used. The kaizen implementation has reduced the percentage of time losses which is 48.44%. More than that, sales order processing lead time was reduced about 6.98% and production lead time reduced about 14.93%. Besides, non value added time and necessary non value added time activities was reduced as much as 60.69% and 57.14% respectively. These results have proved the effectiveness of kaizen methodology.
ABSTRAK

DEDICATION

For my beloved family and friends for their loves and supports.
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<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>AACSB</td>
<td>American Assembly of Collegiate Schools of Business</td>
</tr>
<tr>
<td>ACE</td>
<td>Achieving Competitive Excellence</td>
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<td>BOM</td>
<td>Bill of Material</td>
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<td>CI</td>
<td>Continuous Improvement</td>
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<td>GKS</td>
<td>Godrej Kaizen System</td>
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<td>JIT</td>
<td>Just-In-Time</td>
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<td>NSC</td>
<td>Nippon Steel Corporation</td>
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<tr>
<td>OEE</td>
<td>Overall Equipment Effectiveness</td>
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<td>PDCA</td>
<td>Plan-Do-Check-Action</td>
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<td>PSM</td>
<td>Projek Sarjana Muda</td>
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<td>QC</td>
<td>Quality Circles</td>
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<td>QCC</td>
<td>Quality Control Circle</td>
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<td>RMG</td>
<td>Ready Made Garments</td>
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<td>SMI</td>
<td>Small Medium Industries</td>
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<td>SOPs</td>
<td>Standard Operating Procedures</td>
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<td>TPM</td>
<td>Total Productive Maintenance</td>
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<td>TQC</td>
<td>Total Quality Control</td>
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<td>TWI</td>
<td>Training Within Industry</td>
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<tr>
<td>VA</td>
<td>Value Added</td>
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<tr>
<td>NVA</td>
<td>Non Value Added</td>
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<tr>
<td>NNVA</td>
<td>Necessary Non Value Added</td>
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CHAPTER 1
INTRODUCTION

1.1 Introduction

These chapter overall discuss the introduction of the kaizen implementation (continuous improvement) in the Small Medium Industries (SMI). In this part, the briefing of the background, problem statement, objectives, scope and the expected of the study are discussed.

1.2 Background of study

Nowadays, organizations carry on seeking innovative ideas for improving their processes and retaining a competitive edge. Kaizen is a concept that focuses on improving a work area or an organization in incremental steps by eliminating waste. Kaizen can be applied to any area in need of improvement. Indeed, the overall concept of continuous improvement appears to be applicable to every area of industrial and logistics activity, from the production of basic materials such as steel, aluminium and timber to manufacturing industries as diverse as automotive, furniture, canning, food and drink (Leigh Pomlet, 1994). Many organizations have begun to incorporate the philosophy of kaizen through the use of kaizen methodology. Kaizen project typically focus on specific improvement goals. A kaizen team may include operators, managers, or supervisors from both the work area and from other work areas within the organization. Other support personnel may also be included in the event such as engineers or personnel from outside of the organization. The time period of kaizen
implementation is dependent on the difficulty of the goals and the complexity of the work area. The kaizen team may apply different tools to meet the goals of the kaizen project, such as brainstorming, Why-Why analysis, or Pareto analysis. Kaizen teams may also follow particular methodologies, such as Standard Work.

1.3 Problem Statement

This study focuses on continuous improvement (kaizen) of sales order processing procedure in Small Medium Industries (SMI) in order to reduce time loss and increase customer satisfaction through product that meets their need and on time delivery. Industries especially manufacturing is currently faced with the conflicting pressure to improve customer satisfaction and service as well as pressures of cost reduction, reducing lead time, and quality improvement in order to get better results. Opportunities for productivity improvement through reduced time loss are critical to organizational survival and these efforts can be driven through kaizen initiative such as standard operating procedure or reflow the procedure of sales order processing which will be expose in this case study.

The most important asset of any organization is its customers. Understanding the customer’s needs and expectations is essential to win new business and keeping existing business. An organization must give its customers a quality product that meets their needs at a reasonable price, which includes on-time delivery and outstanding service. In order to make a quality product that meets customer needs is difficult if customer always unsatisfied with the design of product after manufacturer has completed it. This situation created many waste in term of cost and time. By using kaizen methodology and tools, the root cause of the problems are tackle and solved by using problem solving approach such as PDCA.
1.4 Objectives

An objective of this study is:
(a) Identify time losses at production area,
(b) Identify opportunities for kaizen improvement using a problem solving approach,
(c) Describe the effects of the improvement using time measurements.

1.5 Scope

This study will thoroughly focus on reducing time losses while at the same time reducing the lead time of sales order processing in company Micro Zass Sdn. Bhd. and indirectly improve customer satisfaction. This condition will create a win-win situation between company and customers.

1.6 Company Background

Micro Zass Sdn. Bhd. with the status of “bumiputra” company is located at Lot C-6, Kompleks SME Bank, Km. 11, Telok Mas 75460 at Melaka, Malaysia. This company was incorporated in Malaysia under Companies Act 1965 on December 2003 with paid up capital of RM 1000.00.

Micro Zass Sdn. Bhd. is manage and led by selected team of Malaysia Professionals. Their expertises have been gained over a total collective of 25 years. The principal activity of Micro Zass is providing precision tooling & services to the Microelectronic Industry both locally and abroad. Totally committed in proving the best in quality, time delivery and services to the customer, also work with the customer on ways to improve on cost reduction.

By the expansion plan in midst Micro Zass Sdn. Bhd. is working to equip with start-of-the-art machinery to meet the stringent requirements of customer. Besides having highly motivated skilled, experienced tool and die makers and Machinist that can work independently, ensuring
that the provisional able to fulfill all customers demands and capabilities of designing die set and automation systems.

The culmination of these proposals and plans will lead Micro Zass Sdn. Bhd. In setting up new plant and machineries to provide the product and service with efficiently and effectively. In due course, to encourage a proactive participation by all witch leads the objectives of this company be addressed well and prepare to meet the challenges that waits in future.

Micro Zass Sdn. Bhd. also, believe that with the foundation and spirit which laid in the valued board member and partner, accomplishment of the dream able to pursue, and for a brighter future with mutual prosperity.

1.7 Expected Findings

At the end of the study, it’s expected to know about the eliminating of non value added activities after improvement processes through value added analysis. Besides, the reductions of lead time of sales order processing also expected by eliminating non value added activities. Other than that, the effectiveness of kaizen methodology to reduce waste will be found in the end of project by using time measurement.
CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This chapter will proceeds with referenced review from the relevant literature. It’s included the details related to information and history which already done by other people that involved in the kaizen activity previously. It also will explain about methods and tools of kaizen which generally used in various fields.

2.2 Introduction of kaizen

Kaizen was created in Japan following World War II. The word Kaizen means “continuous improvement”. It comes from the Japanese words “kai” which means “change” (to correct) and “zen” which means “good” (for the better). Basically kaizen is for small improvements, but carried out on a continual basis and involve all people in the organization (Venkatesh, 2007). The author also said that the kaizen is opposite to big spectacular innovations and requires no or little investment. The principle behind is that a large number of small improvements are more effective in an organizational environment than a few improvements of large value.

In Brunet and New (2003), it stated that the implication in industry of all the uncontracted and partially contracted activities which take place in the Japanese workplace is carrying by kaizen to enhance the operations and the environment. Kaizen represent the employment of the workforce, providing the main channel for employees
to contribute to their company's development. In fact, the front-line employee is most familiar with the actual work; there may be no one person to ask for improvement ideas (Chen et al., 2000).

Many techniques and tools have been used including quality circles (QC), total quality control (TQC), standard operating procedures (SOPs), total productive maintenance (TPM), suggestion systems, kanban, just-in-time (JIT), productivity improvement, robotics and automation. A study of continuous improvement tool used of Australian firms conducted by Hyland et al. (2000) found that particularly, they more frequently to use three reasonably sophisticated tools which are process mapping tools, quality function deployment and the seven new quality tools.

2.3 History of kaizen

As stated previously, Kaizen methods for work process improvement that include making the improvements originated in the World War II Job Methods training program. It was developed by the Training Within Industry (TWI) organization, a component of the U.S. War Manpower Commission during World War II. Kaizen methods that suggest improvements also originated in the work TWI (Huntzinger, 2002).

As suggestion rather than action improvement programs, Imai points out that, "Less well known is the fact that the suggestion system was brought to Japan. Huntzinger (2002) also traces Kaizen back to the Training Within Industry (TWI) program. TWI was established to maximize industrial productivity from 1940 through 1945.

As the principle of continuous improvement, Kaizen has its origins in W. Edwards Deming”s 14 points. Point 5 states, “Improve constantly and forever" the system of production and service (Deming, 1982).
2.4 Principle of kaizen

Kaizen philosophy embraces three main principles proposed by Imai (1986) which are process orientation, improving and maintaining standard and people orientation. All principles are significant in order to implement the kaizen.

2.4.1 Process orientation

Imai (1986) stated that kaizen is process-oriented. Before results can be improved, processes must be improved, as opposed to result-orientation where outcomes are all that counts. Berger (1997) added to what Imai said that the principle has at least two practical consequences for the improvement process. First, management’s main responsibility is to stimulate and support the effort of organizational members to improve processes. In order to be improved, a process must be understood in detail. Second, process-orientation calls for evaluating criteria which can monitor and bring attention to the improvement process itself, while at the same time acknowledging its outcome (Berger, 1997).

2.4.2 Improving and maintaining standard

Kaizen is distinctive in its focus on small improvements of work standards as a result of an ongoing effort. Furthermore, Imai (1986) said “There can be no improvement where there are no standards” which in essence denotes the relation between kaizen and maintaining standard procedures for all major operations (Standard Operating Procedures (SOPs)) (Berger, 1997).
The three general characteristics have been identified by Berger (1997) as reasons for highlighting standards to which are claimed to follow with the standardization of operating procedures:

(a) Individual authorization and responsibility.

(b) Enhanced learning through the transmittal, accumulation and deployment of experience from one individual to another, between individuals and the organization and from one part of the organization to another.

(c) Discipline.

The PDCA (Plan-Do-Check-Action) problem-solving format is used to support the desired behaviors. In practice, this simple but very systematic format of a “wheel” of never-ending improvements has become the most frequently used symbol for kaizen. It is a quite simple framework for using the different quality tools which make the improvement process both visible and measurable while also serving as the main link between improvements and standardized routine work (Berger, 1997).

In an article by Thomas et al. (2003), they are used the PDCA Cycle as a model to illustrate the process of adopting and using continuous quality improvement at the clinical research site to enhance ethical, quality benchmarking activities.

Related to the approach, Westbrook (1995) also using the PDCA cycle in cases improvement at large Japanese companies. Although the problems of course varied, the deployment of the PDCA cycle was identical in each case. He pointed out that the assumption of PDCA method is followed and the likelihood of a successful solution being obtained at one of the companies was tested and noted that company’s emphasis on strict procedure is itself significant.

Similar as Berger (1997), Thomas et al. (2003) and Westbrook (1995), Shamsuddin and Masjuki (2003) also suggested using Deming’s PDCA which is an excellent technique in monitoring and problem solving for continuous quality improvement where any bright ideas of individuals can be accommodated.