

# UNIVERSITI TEKNIKAL MALAYSIA MELAKA

# IMPLEMENTATION OF QUALITY METHOD TO IMPROVE PROCEDURE IN HANDLING QUALITY ISSUE AT SME INDUSTRY

This report is submitted in accordance with the requirement of Universiti Teknikal

Malaysia Melaka (UTeM) for the Bachelor of Manufacturing Engineering

Technology (Process and Technology) with Honours

by

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#### **BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA**

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# **DECLARATION**

I hereby, declared this report entitled "Implementation of quality method to improve procedure in handling quality issue at SME industry" is the results of my own research except as cited in references.

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# **APPROVAL**

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Manufacturing Engineering Technology (Process and Technology) with Honours. The member of the supervisory is as follow:

.....

MR MAZRAN BIN AHMAD

(Project Supervisor)

## **ABSTRACT**

All organizations need to have a good quality method as a sign that they have achieved an excellent quality according to the demand of organization and customer. The reason why "implementation of quality method to improve procedures in handling quality issue" important to be discussed in this project because once the group has identified possible temporary fixes and address quality issues, the shortterm solution should be quick, easy to implement and worth the effort. Quality method and techniques such as TQM (PDCA cycle), Six Sigma (DMAIC cycle), 5 Whys, QFD, Lean, FMEA and 7 QC Tools are studied and the best among them have been implement at the SME industry as to improve procedure when handling quality issues. Then, the selected quality method that include 7 QC Tools, 5 Whys Analysis and Lean Manufacturing have been used in LIDAP cycle and Continuous Improvement. The LIDAP cycle represent 5 phases which are List phase, Investigate phase, Detect phase, Act phase and Preventive phase. All 5 phases required a vital document that indicated Tally sheet in List phase, Fishbone Diagram in Investigate phase, 5 Whys Analysis in Detect phase, Countermeasure Sheet in Act phase and Preventive Sheet in prevent phase. Next, Continuous Improvement (Kaizen) use as the process of continuous improvement in small increments that make the process more efficient, under control and adaptable. Improvements are usually accomplished in a little or no cost, without sophisticated techniques or without expensive equipment. As for results in applying this LIDAP cycle, made SHH Poultry Farm industry have an opportunity for having their own SOP (Standard Operating Procedure) in handling quality issues that occur in their industry. The good result of reduction in same quality issue occur and cost and also good response of SHH employees in term of this implementation quality method have been discussed. The review also found that resistance to change, failure to motivate employees, lack of understanding on companies' strategic path and difficulties in managing itself formed some of the challenges in implementing LIDAP cycle and Kaizen. Hopefully, this paper can be beneficial to the SME Enterprises as in formulating their implementation of quality method and Kaizen strategies.

#### **ABSTRAK**

Semua organisasi perlu mempunyai kaedah kualiti yang baik sebagai tanda bahawa mereka telah mencapai kualiti yang sangat baik mengikut permintaan organisasi dan pelanggan. Antara sebab mengapa "Perlaksanaan penambahbaikkan kaedah kualiti untuk meningkatkan prosedur menjadi penting bagi dibincangkan didalam projek ini adalah kerana apabila sekumpulan pekerja berjaya mengenal pasti masalah dan jalan penyelesaian, masa yang diperlukan menjadi cepat, mudah untuk dilaksanakan dan berbaloi. 7 jenis kaedah kualiti seperti "TQM (PDCA cycle)", "Six Sigma (DMAIC cycle)", "5 Whys", "QFD", "Lean", "FMEA" dan "7 QC Tools" dipelajari dan kemudiannya yang terbaik diantara mereka digunakan sebagai penambahbaikkan "7 QC Tools", "5 Whys" dan "Lean" dipilih sebagai kaedah kualiti. penambahbaikkan kaedah kualiti dan digunakan dalam kitaran "LIDAP" dan Kaizen. Kitaran "LIDAP" terdiri daripada 5 peringkat iaitu Menyenarai, Menyiasat, Mengesan, Mengambil Tindakan dan Mencegah. Seterusnya, penambahbaikan berterusan (Kaizen) digunakan sebagai proses penambahbaikan yang berterusan dalam kenaikan kecil yang membuat proses yang lebih cekap, terkawal dan cepat. Penambahbaikan ini dapat dicapai dengan sedikit atau tiada kos, tanpa teknik canggih atau tanpa peralatan yang mahal. Akhirnya, dengan menggunakan kitaran LIDAP ini, menjadikan industri SHH Poultry Farm mempunyai peluang untuk mempunyai SOP mereka sendiri (Standard Operating Procedure) dalam menangani isu-isu kualiti yang berlaku dalam industri mereka. Hasil yang baik iaitu pengurangan dalam isu kualiti yang sama berlaku dan kos serta sambutan yang baik oleh pekerja SHH dari segi kaedah kualiti pelaksanaan ini telah dibincangkan. Kajian ini juga mendapati bahawa rintangan kepada perubahan, kegagalan untuk memberi motivasi kepada pekerja, kekurangan pemahaman strategik dan kesukaran dalam cara pengurusan membentuk beberapa cabaran untuk melaksanakan kitaran LIDAP dan Kaizen di dalam syarikat. Akhir sekali, mudah-mudahan, artikel ini boleh memberi manfaat kepada industri PKS sekiranya mereka ingin merangka pelaksanaan penambahbaikkan kaedah kualiti dan strategi Kaizen.

# **DEDICATION**

This project is especially dedicated to my beloved family, project supervisor and all my friends for being my great pillars of support throughout my journey of education.

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## LIST OF SYMBOLS AND ABBREVIATIONS

UTeM - Universiti Teknikal Malaysia Melaka

SME - Small Medium Size Enterprise

Sdn Bhd - Sendirian Berhad

ISO - International Organization for Standardization

TQM - Total Quality Management

PDCA - Plan, Do, Check, Act

DMAIC - Define, Measure, Analyse, Improve, Control

QFD - Quality Function Deployment FMEA - Failure Mode Effect Analysis

QC - Quality Control

SOP - Standard operating procedure

GDP - Gross domestic product

ASQ - American Society for Quality

VOC - Voice of the customer

HOQ - House of quality

TPS - Toyota Production System

VSM - Value Stream Mapping

JIT - Just In Time production

TPM - Total Productive Maintenance

5S - Sort, Set in order, Shine, Standardize and Sustain

CTQ - Critical to Quality

4M 1E - Manpower, methods, machine, materials, and

environment

PSM - Projek Sarjana Muda

LIDAP - List, Investigate, Detect, Act, Prevent

#### CHAPTER 1

#### INTRODUCTION

#### 1.1 Introduction

This chapter provides an overview of the project titled "Implementation of quality method to improve procedure in handling quality issue in SME industry". This chapter contains the history about quality method, the importance of having quality methods, quality definitions, company background, problem statements, project objective, scope of study and the importance of this study.

Quality method history has begun in the early 1920s, since the interwar period. The initial approaches arose from American theorists and practitioners, it was predominantly Japanese companies that undertook the early commercial applications (Jim Lamar, 2011). Then, over the years it has undergone several transformations, due to the needs of organizations and business environment. All organizations include of the SME industry need to have a good quality method as a sign that they have achieved an excellent quality according to the demand of organization and customer. We know that from the foregoing that quality is a result produce when a need, expectation, requirement or demand is met or satisfied. Something that does not satisfy the need is deemed poor quality and something that meets the need in every way is deemed excellent quality. We can define the term "quality" in many ways, but the ISO family of standards gives a very concise definition "quality as the degree to which a set of inherent characteristics fulfills requirements."

Today, the subject of quality is sufficient to be treated as a specialized field of study on its own (Gerhard Plenert, 2012). However, the subject area of quality keeps advancing in both depth and breadth with the scope of application of quality tools, techniques and methodologies having expanded beyond the traditional

manufacturing arena. Quality issues are now the concern of all organizations, especially at SME industry. Most of them have several major challenges that an organization must overcome such as inefficient procedures, lack of capital, lack of management skills, employee skills and others to make that industry more viable. The reason why proper procedures in handling quality issue important to be discussed in this project because once the group has identified possible temporary fixes and address issues, the short-term solution should be quick, easy to implement and worth the effort.

The quality method can be varied in different industry. Quality method and techniques such as TQM (PDCA cycle), Six Sigma (DMAIC cycle), 5 Whys, QFD, Lean, FMEA and 7 QC Tools are studied and the best among them will be selected to be used, combined or implement at the SME industry as to improve procedure when handling quality issues. By that, the improvement procedure without cost, easy to understand, with the solution data record will be produced even thought when they are lack of financial, lack of employee skills and lack of number of employees.

#### 1.2 Company Background

My direct industry on this project is SHH Poultry Farm Shd Bhd. SHH Poultry Farm Shd Bhd was started in 1982 as a small poultry farm. The story of SHH began about half a century ago, there was an egg stall in one of the markets in Penang. The owner went through his small business day by day. The stall's demand for quality was reasonable, but its suppliers and could not match the demand in a static way, then it had triggered off the owner's estimate of beginning his own production, the idea bore fruit quickly. And so, in 2002 he put up a Ladang Ternakan Sungai Patani Sdn Bhd as his second arm. He grew the business step by step and established another company which is SHH Marketing & Distribution Sdn Bhd in 2004 that also located near to SHH Poultry Farm Shd Bhd. Nowadays, this smaller egg stall has taken in a bunch of familiar household egg brands and growth to become medium in size.

Until June 2016, the total number of employees at the SHH Poultry Farm is 100. SHH Poultry Farm Shd Bhd focuses on consumer healthy and satisfying. They want

that all their consumer able to enjoy fresh, healthy eggs according to consumer demand by producing high quality fresh eggs every day. Thus, the SHH Poultry Farm has conducted a quality inspection of their merchandise to ensure consistent egg quality throughout the range. SHH takes out 3 eggs every day from each batch for sample testing. Each batch has to undergo 3 tests throughout 14 days. The 3 eggs will be tested on the first day, the 7th and the 14th day respectively, with the tests of 6 major quality control projects to inspect egg quality which include protein concentration, egg yolk length, egg yolk colour, shell thickness, shell hardness and egg freshness. They also has conducted rigorous tests on each batch of eggs with cutting-edge instruments to insure the stability and health quality of their eggs.

Besides quite a little sampling, SHH imprints a different serial number on every egg at the same time to facilitate quality tracking. This quality tracking system enables them to trace the production date, class and brand of a particular egg. Through the quality tracking system, SHH can tell the ins and outs of their eggs product and monitor their retailers' inventory control. SHH is Malaysia's long-standing name for quality eggs, having established various successful brands to cater for various market demands. With aggressive diversification, SHH has expanded its market from northern Malaysia to Malacca, with customers, including but not limited to wholesalers, supermarkets, hypermarkets, hotels, etc. It has expanded its market gradually with fresh quality eggs that inspire consumer confidence in its own branding. SHH has successfully produced 10 different brands of healthy eggs, to conform to the trend of branding and the need for market segmentation.

#### 1.2.1 Premises and Facility

SHH Poultry Farm is located in Jawi, Penang. Occupying a land area of 15 acres, it houses 10 chicken coops. SHH Poultry Farm Shd Bhd building is shown in Figure 1.1. Address of SHH:

SHH Poultry Farm Shd Bhd, Jalan Sungai Baong, 14200 Sungai Jawi, Pulau Pinang, Malaysia.



Figure 1.1: SHH Poultry Farm Shd Bhd building

Main facilities and machine available includes home for the foreign workers, toilet, quality assurance machine (Figure 1.2) and egg grading machine.



Figure 1.2: Quality assurance machine

#### 1.2.2 Products

This are 10 different brands of healthy eggs product at SHH Poultry Farm Sdn Bhd. (Figure 1.3)

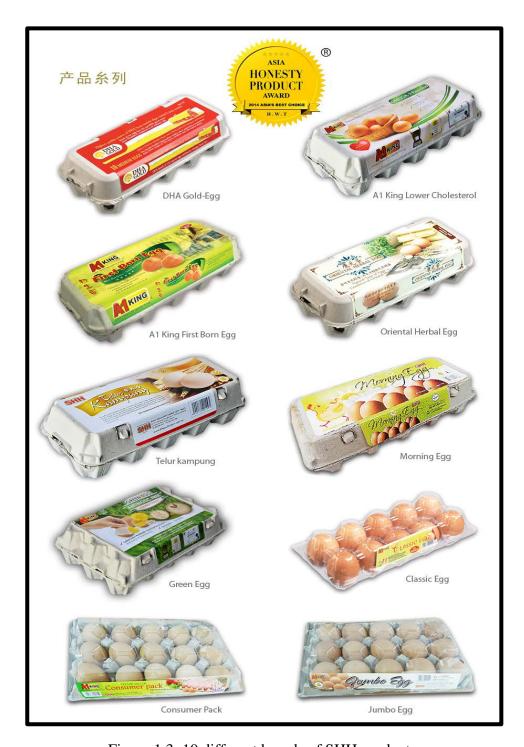


Figure 1.3: 10 different brands of SHH products

#### 1.3 Problem Statements

One of the SME industry like SHH Poultry Farm Sdn Bhd that classified as family-owned businesses have started a small poultry farm in 1982 and now become a medium size industry. However, SHH Poultry Farm's current quality method is an ineffective usage of the industry time and resources. By wasting employee man hours in handling quality issue, the current quality method makes the industry less competitive and lead to a slow working process. For example, when the quality issue come, just one person will be in charge and the same matter will keep repeating just in a short time. In addition, SHH industry has several challenges such as lack of capital and lack of number of employees who make it do not have the opportunity to have a standard procedure. Besides, 75% employees in SHH industry are foreign worker that unskilled to handle quality issues in a proper way. Hence, implementation of quality methods is needed to improve procedure in handling quality issue in the SHH Poultry Farm industry. By that, all employees know what to do and how to do well when handling quality issue in a proper way.

#### 1.4 Objectives

The following are the objectives of this project:

- To study the best quality method in handling quality issue due to less use of industry time and resources to be applied in SHH Poultry Farm Sdn Bhd industry.
- To implement that selected quality method as a proper procedure without cost or low cost and does not require a huge number of employees in handling quality issue in the SHH Poultry Farm industry.

• To measure the effectiveness of the improvement procedure in handling quality issue on the SHH Poultry Farm in term of evaluation based on questioners of level difficulty and also time needs to address the quality issue.

#### 1.5 Scope of Study

This project is targeting to SHH Poultry Farm Sdn Bhd that do not have proper procedure in handling quality issue. It will be covered on implementation of quality method to improve procedure in handling quality issue. Seven types of quality method and techniques include Lean Manufacturing, TQM (PDCA), 5 Whys, Six Sigma (DMAIC), FMEA, QFD and 7 QC tools are studied and the best among them will be use or implement at SHH Poultry Farm. Then, the selected quality method is more discussed in this project with its advantages and disadvantages. The data were gathered from primary and secondary data. The primary data include gathering data from questionnaires and observations while the secondary data are literature reviews from journals, books and internet. However, no specific improvement of quality in the product is discussed because this project is focused on an improvement of procedure in handling quality issues.

#### 1.6 Importance of Study

The importance of this study is as follows:

- ➤ In an effort to help small-scale industries that need a help to have their own standard operating procedure (SOP) according to the need of the team and demand of the customer.
- As a foremost step for manufacturing technology students to ascertain the quality subject deeper and its importance to be applicable industry-industrial.

## **CHAPTER 2**

#### LITERATURE REVIEW

#### 2.1 Introduction

This chapter contains the definitions of the SME industry, quality and procedure. A detailed description about them is also provided in order to give an understanding of the philosophy. On top of that, since this study is focusing on the quality method, tools and techniques, the basic quality method, tools and techniques are also explained in this chapter.

#### 2.2 Small and Medium Enterprises (SME)

This project is focusing on SME industry. Therefore, the description about SME in term of the nation and also of Malaysia are becoming an important thing to be discussed. Based on (Khalique et al., 2011), SMEs can be established in any locality for any kind of business activity in the urban or rural area. SME that refers to the Small and Medium Sized Enterprises and such sort of businesses generally have the largest shares in countries' economic systems as well as they have vital places in the developed countries and developing rural areas and in each development plan, the most important parts and responsibilities have been supplied to the SMEs. Especially at present, SME is playing an increasingly important role in ensuring the appropriate growth of the national economy, easing the employment pressure, rejuvenating the country through science and education and optimizing the economic structure.

According to Reider (2008, 17), the two main primary reasons for the existence of small firms are: (1) to provide commodities and services to fill customers' needs in a way that they will continue to employ and recommend the firms' goods and services,

i.e. "customer service business" and (2) to create desired goods and services so that the investiture in the firm is converted to cash as quickly as possible, i.e. "cash conversion business" (Armstrong & Drnevich, 2009). The specific definition for SMEs, used by each country in the world, is usually based on several different measures which include sales or assets, the number of employees and levels of capital, (Mohammad, 2012).

#### 2.2.1 Small and Medium Enterprises of Malaysia

As the SME are prominent in the world, SME are also playing a vital role in the Malaysian economy and are considered to be the backbone of industrial development in the country (Saleh & Ndubisi, 2006). According to SME International Malaysia (2013), some advanced economies have succeeded because SMEs form a fundamental part of the economy, comprising over 98% of total establishments and contributing to over 65% of employment as well as over 50% of the gross domestic product (GDP).

Developing stronger SMEs require major changes in the manufacturing sector, as SMEs make up over 90% of the Malaysia's manufacturing sector. In the year 2014, the value added of SMEs contributed 35.9% to Gross Domestic Product (GDP) at constant 2010 prices and 35.8% at current prices as depicted in Table 2.1. This has portrayed the importance of SMEs industry in supporting and upholding the momentum of the Malaysia's economy. By that, we can see that without SMEs, the large enterprises cannot even achieve more than RM 1000 billion in Gross Domestic Product (GDP).

CATEGORY	VALUE ADDED (RM BILLION)		SHARE (%)	
	Current Prices	Constant 2010 Prices	Current Prices	Constant 2010 Prices
SMEs	396.6	363.5	35.8	35.9
Large Enterprises	710.0	649.0	64.2	64.1
GDP	1,106.6	1,012.5	100.0	100.0