

Case Improvement based on Lower Quality Mode and Effects Analysis

Nur Adillah Abdul Razak*, Shahryar Sorooshian

Faculty of Industrial Management, University Malaysia Pahang, Malaysia

* Corresponding author. Tel.: +60139805752;

E-mail address: Adilla.razak87@yahoo.com

Abstract

Keywords:

*Quality,
Continuous improvement,
Quality Management,
FMEA, 5S,*

Quality management has always be a heart to operation process in an organization. The impact of not implementing good quality can be catastrophic and severe to business activity, thus highly imperative attention is needed. Total Quality Management has significant influence in Quality Management System practiced in an organization that provide method to promote continual improvement. A case of a Malaysian local family-business based company chosen to identify and study the quality management practiced. The causes and effect diagram and Failure Mode Effect analysis (FMEA) used to find out the inherent level of quality exercised. From findings, the premise environment gave the highest score in FMEA showing that responsiveness in keeping and maintaining premise environment is vitally crucial and action should be taken, in fact, poor quality management issue can be rectify via implementing 5S steps. However, implementing 5S alone without continuous improvement will not achieved the company quality objectives.

Accepted: 26 April 2015

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1. Introduction

Different people/organizations have been defined in Quality in different ways. “Fred Smith, CEO of Federal Express, defined quality as performance to the standard expected by the customer, the General Services Administration (GSA) defines quality as meeting the customer’s needs the first time and every time, and Boeing defines quality as providing our customers with products and services that consistently meet their needs and expectations” [1]. At the end of the discussion, quality is defined as to meet and exceed customers need based on their preferences. Total Quality Management (TQM) is a structured and comprehensive approach to organizational management that seeks to boost the quality of services and products through continuous ongoing refinements in response to feedbacks.

“Requirements of TQM may be defined separately for a particular organization” [2].

TQM originally applied in manufacturing sector for decades and since then TQM has been adopted to many organizations in any industry globally. Any firms who run business based on quality and making profit from customer satisfaction are subjected to TQM.. TQM is based on quality management from the customer's point of view. TQM are consist of four sequential steps: plan, do, check, and act (the PDCA cycle). The first step is the planning phase, people identify and define the problem to be addressed, collect relevant data, and find the problem's root cause; in the second phase which is doing phase, people execute and implement a solution, and decide upon a measurement to gauge its effectiveness; in the third

checking phase, people confirm the results through before-and-after data recorded comparison; in the last acting phase, a person will record their results, letting others know about the process changes, and propose recommendations for the issue to be monitored in the next cycle.

The ISO9000 is a series of standards and guideline related to the management system of quality. It sets the requirements for the assurance of quality and for management's involvement [1]The function of ISO9000 is guide organizations in implementing quality management system conforming to the specific requirements and through the consistent, demanding service of the quality management, to meet and exceed customer satisfaction by fulfilling customer needs, achieve continual improvement of organization efficiency and competitiveness, make continuous improvement within processes, operation, products, and services, and fulfill the rules and regulations set up.

Continual improvement is part of an important element in quality management system. 5S is a technique that widely used in any organization in any industry to keep quality management system in place. It is consists of five items named sort, straighten, shine, standardize and sustain. Sorting all unnecessary items at work place (storage bins, equipment, parts, tools, etc) can be done by removing and either stored or discarded elsewhere. This step de-clutters the segregate tools, materials and workspace that are used frequently [3] Arrange everything, the wanted and unwanted stuffs in the working area so that the work flows in an orderly fashion. This often involves innovates storage solutions which simplify the flow of work, by placing frequently used items so they are accessible for all the time. This phase is usually about a workstation but can also include rearranging process phases to improve work flow on a large

scale [3]. Also 'Shine' is another important part of the ongoing operation where the work environment and equipment are cleaned and restored to their designated location at the end of their each shifts. Basic preventative maintenance tasks are part of this. The workstation would then be ready for the next user for the next shift and the element created in the first two steps is preserved.

It is compulsory to ensure that all employee knows the steps to follow and to establish expectations for the operation process. In order to adapt the changes, it is necessary to have training, workshop, have standard operation procedures, work instructions, and use photos, checklists, and/or visual guides. It can be easier to make changes if subordinates of the system known why they are made, educating them and get them involved in making the changes in the first place. Visual types of controls include the familiar tape markings and shadow board. Other visual control used in manufacturing plant is the Log out Tag out (LOTO) method to inform people of what is under construction and what is in proper condition. The information consist in LOTO system is last date being used, the person in charged to keep it up to date and calibration date. With this system less problem will associated in operation process.

An organization who decided to adopt 5S in their operation system must ensure to keep it ongoing until the end. This is because the effort of sorting and rearranging items are such a waste as financial supports have been allocated to make 5S system a company culture. They need to follow up over a time period until the 'new way' becomes entrenched. It is well known that this is not an easy thing to do when involving human in the system. So it is vitally important for management people to think of how to make sure it an acceptable culture less burden the employee. If it is impossible to

sustain the new processes, the old practice will always back on track old state. Thus, 'mini-audits', strategies include, ongoing continuous improvement efforts and daily meetings should be pay attention.

2. Case study

2.1. Introduction of company

In Malaysia, Bena Hijaz Enterprise began operating on a small scale in the house in 1996. This business carried on as it is industry that make traditional biscuits so called "Kuih Kapit", "Rempeyek" and "Kuih Bangkit". At that time, about 80% of villagers making on this product. In addition to producing its own products, the company also took Bena Hijaz byproduct from the other villagers to be marketed. In 2004, the Bena Hijaz enterprise has stopped making biscuit products because the biscuits cannot be produced continuously. This is because these products are produced manually and need more man power. In 2007, the Bina Hijaz enterprise has been reoperation the business after they have found a "Kuih Kapit" machine maker that 30% functioned automatically. In 2008, the company had moved from the house to the backyard of their home which is a workshop. In 2009, a workshop at the back of the house has been upgraded to have halal certification from JAKIM. Finally, in May 2012, the company has moved to a bigger factory, which is in the industry area with address Lot A1, Factory IKS LKPP, Pusat Pertumbuhan Desa Kampong Soi, 25150 Kuantan, Pahang. The Company currently is seeking Good Manufacturing Practise (GMP) certification as soon as possible. Most of Bina Hijaz customers are from local area, West Peninsular and East Peninsular and also have reached Singapore and Dubai. However, the marketing is not doing very well at overseas force the owner to stop exporting the products.

2.2. Current practice in the organization

This family business is run solely by the owner, Mr. Jaafar assisted by his one and only son that requires him to manage and monitor the overall process. Even though this business have operated almost over 10 years, there is no proper and systematic quality management practiced and adopted into the organization operation structure. As such starting from receiving raw material, storage planning, production process, inventory management and documentation. Leaking in quality control management do disturbing the efficiency of business process.

People: Limited workforce has forced Mr.Jaafar to run the business by himself from obtaining the raw materials, mixing the ingredients, maintenance of machineries and product innovation. 4 workers from neighborhood were hired to help the production process, packaging and labelling the products. Even though it is not very difficult for him to find employee, but the turnover of worker is seems very high. New employee come and go easily and require training to be conducted frequently contribute to the big amount of material wastage. High level of employee turnover do affecting the quality control process in maintaining the product freshness and taste.

Premise/Environment: The first impression pop out from my mind from the factory visit is, "Is this a food manufacturing or just a warehouse?" .Obviously the building structure is not well preserved, unorganized machineries in the production line and poor showroom aesthetic environment are the biggest issue with the firm. The major issue captured is the arrangement, housekeeping and the cleanliness of the cooking tools, machineries, raw materials and products arrangement. The machineries wire cable connected to plug is scatter around on the floor

promoting the unsafe workplace environment. No proper wire secured and tagged to increase the visibility of the wire as employee might accidentally stumbled and fallen.

Process: The commercial traditional production process is not very complex and easy to understand. The process start with mixing of the appropriate amount of selected ingredients, frying and cooling at optimum temperature to ensure freshness, packaging and labelling and last but not least inventory delivery to customers within expected duration. The mixing and frying process is the crucial part of the overall process. Little changes in the process could end up not meeting the specification.

Product: The high product quality and freshness is the value that Bina Hijaz wants to deliver to their customers. Failure to reach customers expectation results in losing current and future potential customers. Bina Hijaz offer three major range of products under Sammez brand, there are “Kuih Kapit”, “Rempeyek” and “Bangkit”. Both “Kuih

Kapit” and “Rempeyek” are the most favourable product bought until now except for “Bangkit”. Survey has been carried out among customers and most of them saying that “Bangkit” taste has not reach their satisfaction. Other than that, Bina Hijaz also obtained local products and act like a retail firm. This practice can give impact to their image as the product quality from homemade product is questionable.

There is four major issue captured along the visit and observation discussed previously. The causes and effect diagram used and shown in Figure 1 represents and summarized the current issues related to Bina Hijaz operating activities. The major purpose of the CE Diagram is to act as a first step in problem solving by generating a comprehensive list of possible causes. It can lead to immediate identification of major causes and point to the potential remedial actions or, failing this, it may indicate the best potential areas for further exploration and analysis. At a minimum, preparing a CE Diagram will lead to greater understanding of the problem [4].



Fig 1: Cause and Effect diagram

3. Case analysis

3.1. Lower quality Mode

Bina Hijaz has experienced up and down in business that encourage the owner to stay sustain in this traditional cookies manufacturing. Manpower,

premise environment, production process and product quality are the issue need to be handled effectively in order to meet the objective. This four elements can be concluded necessitate excellence total quality management. To be clear, manpower

availability, production process and product quality are operated under one roof of premise environment. By tackle the main issue, which is the improper and unorganized arrangement of premise environment, the other issue related are solved simultaneously. The improper and unorganized facilities of the factory and showroom is because of less concern about cleanliness and housekeeping. For example of the housekeeping issue is unwanted stuff and expired products kept on the shelf in the showroom. This event can cause bad reputation to the owner and promote negative thought among supplier and customers how the product quality and freshness being neglected.

The other issue arise from the poor housekeeping planning are improper labelling and barricade of tools and equipment, out of service machine stored next to the operating machine, no maintenance and calibration schedule and inappropriate waste management schedule. Those activities, directly and indirectly, affecting the overall manufacturing process. Unclean and unsafe workplace could demotivated employee to stay focus on the task given. For example the, wire cable that not being used are scattered on the floor creates unsafe environment. Employee could tripped or stumbled

because of it. Unhappy employee leads to decline in production. Thus, it is vitally important to make sure the environment issue need to be solved immediately. Hence, appropriate housekeeping planning, implementing the task and reviewing the performance shall be execute promptly.

FMEA (Failure Mode Effect Analysis) is one of the most effective and useful techniques for developing services, operation processes and designs. The aim of FMEA is to align the risk with its source, as closely as possible. This enables the determination of the foundation cause of the risk, and allows the selection of ways to detect the occurrence of a particular failure and to find solutions to mitigate or prevent the effects of a particular failure mode [5]. The FMEA method used based on risk priority number (RPN) to identify the highest causes contribute to the problem. Data for this study is based on the researcher's judgment, which is based on the qualitative data from interview with the company manager. Risk priority number is a function of multiple Severity (S), occurrence (O), and detection (D); as Figure 2 shows, the RPNs with 256 points for premise environment which is the highest score.

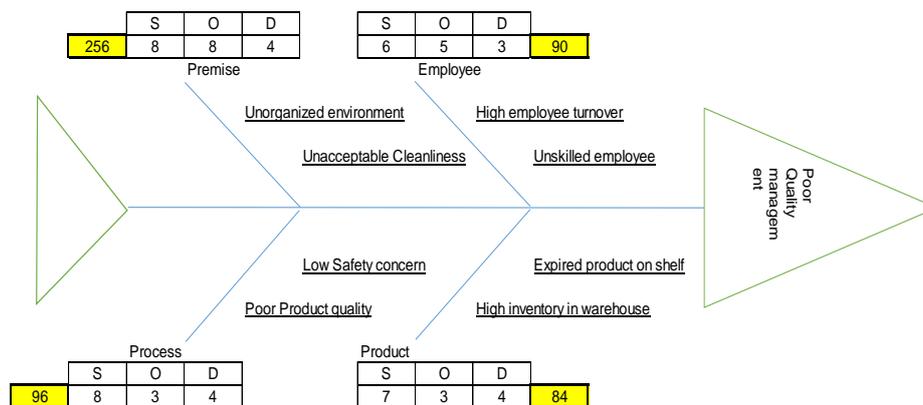


Fig 2: Failure Mode Effect Analysis

3.2. Improvement and Recommendation

The issue highlighted in previous section can be mitigated by implementation of 5S practice for continuous improvement purposes and also the corrective and preventive action. 5S practice suit for housekeeping and cleaning exercise by helping managing the tools and equipment in orderly arrangement and promote better workplace environment.

This can be achieved by adequate planning, implementing, checking and act rules of thumb. The first step in 5S is that can be carried out is to sort out everything in the factory and showroom the unnecessary tools, cable, equipment, storage bins and expired product on shelf. Removed those unwanted items elsewhere or kept it in the store. Only stuff that being used frequently available at workspace. Once the unwanted materials discarded, arrange the tools, machine and products that left for future use in an orderly fashion, especially in the manufacturing area. The appropriate arrangement of machineries, storage of raw materials and product processing equipment help in improve the overall production process as it provide easy access and better workflow activities.

In order to maintain the workplace arrangement, frequent sweeping and cleaning is important to create continuous clean and organized factory and showroom. Thus help the owner to identify the inconvenience condition easily. Sweeping and cleaning task shall be done every day at the end of the shift to reduce time consumed for the next day. Establishing the Standard Operation Procedures (SOP) and introduce it to employee is crucial.

The objective of SOP is to provide guideline to standardize the 5S practice at workplace. Containing task distribution, method to perform task and reporting mechanism if non-compliance activity observed. Last but not least is the step to sustain all the efforts discussed above. In order to

maintain, frequent checking and audit is compulsory throughout the process. The way to sustain in implementing 5S is by make sure all employee and management comply with the established SOP, keep updating the procedure for any improvements and monitoring the quality performance.

4. Conclusions

Based on the finding highlighted using causes and effect diagram and FMEA method, describes that the poor quality management issue can be solved by implementing 5S into operation of Bina Hijaz Quality Management System and the owner has agreed to adapt 5S practice in their organization. Even though it might require proper planning, extra cost for training and involve long term commitment, it is still can be done

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