A STUDY ON DEFECT RATE OF PACKAGING IN MANUFACTURING COMPANY

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ABSTRACT

This research is a study on defect rate of packaging in manufacturing company. The aims of this research are to identify the factor that contributed in the packaging defect at a manufacturing company and to give the suggestion to solve the problem of packaging defect. This research is a case study and was performed at one of the manufacturing company that produces spices and conducts the process of packaging at Idera Mahkota, Kuantan, Pahang. Data are obtained from the observation, interview and data collection at the manufacturing company. The data and the interview feedback will be analyzed by using the Minitab software and used the method of Pareto diagram and Cause and Effect diagram. The result shows that the manpower is the major factor that contributed to the packaging defect to this company. The results from this study can help the company to know the root cause of the problem and to reduce the defect from the factor that has been found.
ABSTRAK

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Nowadays, there is a lot of competition in every product on the market. It becomes very important to a manufacturing company to find a way from a variety of approaches to managing and preventing any possible defects. So, the products can be known and always get place in the market. According to Rundh (2005) package attracts consumer's attention to particular brand, enhances its image, and influences consumer's perceptions about product. It' because packaging is the best role for promotional and it can be used to attract customers' attention and encourage them to examine the product.

In addition, packaging can be defined as a technology of enclosing or protecting products for distribution, storage, sale, and use. Packaging also refers to the process or the operation of wrapping, packing or enters a product into the design of the unit or container. Packaging has be designed to protect, preserve product from any damage or circumstances can alter or damage the product whether physical or biological damage and presents products more effectively to customer satisfaction.
Besides that, there are several important criteria in packaging should be watched in terms of color, typefaces (typography), description, company logo, name and address of the company, packaging design and layout of the packaging. Therefore, an aspect of product packaging is one of the important things that should be concern.

Furthermore, the packaging of a product is very important element that must be well so there is no damage that could affect the quality of an image and packaging in planning the production of a product. However, there are still a lot of problems in packaging that given less of attention and will influence the company profit.

According to the business dictionary, defects also can be define as a frailty or shortcoming that prevents a task from being complete, desirable, effective, safe, or make it to malfunction or fail in its purpose. That is because the substantial defect will be cause of significant losses to an organization, such as rejected in quality of packaging, wasting resources, wasting of time, cost and so on. Other than that, there may be several reasons the defect that occurs in packaging. The defect might be occurs due to the human errors, machines breakdown, material used, environmental issues, limited resources and etc.

However, the defect that occurs in packaging still can be reduced and controlled if the manufacturing company a concerned and know the root causes of this problem. It will be easier to company to control and solve the problem. Furthermore, it also can give a benefit to the company such as the company can reduce the defect, cost, time and increase their profit. Therefore, the manufacturing company needs to concern about the problem a find the solution from the root cause of the problem before the defect occurs and become serious.

Thus, in this research there are several methods that will be studied to identify the key factors that contributed in the packaging defect and give the suggestion to the company to solve the problem in packaging defect. In addition, it also will help the company to solve the problem at an early stage in order to not repeat the same problem.
1.2 PROBLEM BACKGROUND

Packaging is a very important element to ensure the safety of products that are not easily damaged. In addition, the packaging also can reflect the quality of the product and the image of the company that produces the product. It’s because according to Schoell, (1985), packaging is an important integrative aspect of the product and often a critical factor in the success or failure of a given product.

Other than that, packaging also is crucial, given that it is the first thing that public sees before making the final decision to buy (Vidales, 1995). Thus, the packaging should be considered in order to achieve a specified quality standard. It's because the packaging is an important integrative aspect of the product that will affect the success or failure of the product and also will influence the brand and product that produced by the company.

However, there are several factors that may contribute to the defects that will affect the quality of the packaging. Among the factors that may contribute to the occurrence of defects on the packaging are caused by human error, machine breakdown, environmental issues, limited resources, the type of production process, the method of packaging and other. This will contribute to the defect of the packaging, if the company a not consider about the problem at the earliest stage.

In addition, the quality of material in packaging also important and must met the standard of material to avoid the defect occurs in the packaging process. Meanwhile, machines breakdown also will contribute to the defect in packaging. It’s because the manufacturing company will face difficulties in the process of packing and will cause many defects in the packaging. It’s also will affect to the productivity, cost, time and profitability of the company.
Besides that, defects also happen due to the human errors. It might happen because of the less communication, misunderstanding of instruction or interpretation, lack of worker training, improper implementation and other. Therefore, the company must consider about the problem at the earliest stage to avoid this problem become serious and will contribute to the packaging defect.

Furthermore, the packaging defect also involves the cost, time and impact on company profits. Consequently, to reduce packaging defect, the manufacturer must know the exact cause and determine how the unique methods to address each problem. Other than that, the company also must to find the best solution to identify the factor that contribute to the defect of the packaging and choose the best solution or method to solve it.

1.3 PROBLEM STATEMENT

Packaging is very important because it can affect the quality of a product. So, one of the factors to maximize the quality of the product is by reducing any defects that occurs to the product like defect in packaging. According to Cambridge Dictionary, defect also can be defined as a fault or a problem in something that cause them to not function properly. Therefore, the manufacturing company needs to concern about the problem and try to find the best solution for the problem occur to reduce the defects especially from the packaging defects. It's because defect will give a negative impact to the company and will bring loss to the company.

In addition, the quality of the packaging is also dependent on many factors, including the quality of raw materials, the type of production process, certain machines, the efficiency of labor and machinery. Mostly, the problem occurs in the manufacturing company because of the company do not concerns for all the problems occur and do not know the real problem or the root cause of the problem occur.
Besides that, the company that faced the problem in the packaging defect also had problem and difficulties which are still unsolved and the same problem always happen and became increase in the manufacturing company. Therefore, the all problem happen will bring a negative impact to the manufacturing company such as in cost, time, and production of the company.

Other than that, the situations might be occurring in the manufacturing company because there is no professional position in the company such as an engineer to monitor and solve these problems in the company. Furthermore, the limitation of the budget also will be the issues for the company that faces the problem. This is because the company just wants the effective method with the lowest cost to overcome the problem. Therefore, the manufacturing company must find the simple method, easy to understand and to be applied to the company and also not require the cost. Through this research will help the manufacturing company to identify the factor that contributed to the packaging defect and to solve the problem that has been faced by the factor that has been found. In addition, it also can help reduce the cost, time, reduced packaging defects, enhance product quality and maximize profit.

1.4 RESEARCH OBJECTIVE

The objectives of this research are to summarize what is to be achieved by the study. Research objective a shown below:

1) To identify the factor that contributed in packaging defect at manufacturing company

2) To suggest the solution to solve the problem of packaging defect at manufacturing company
1.5 RESEARCH QUESTION

Based on the research objectives above, research questions are formulated as follows:

1) What is the factor that contributed in packaging defect at manufacturing company?

2) What are suggestions to solve the problem of packaging defect at manufacturing company?

1.6 SCOPE OF STUDY

This study will be done at one of the manufacturing company that produces spices and conduct the process of packaging at Indera Mahkota, Kuantan, Pahang. The scope of this study is aimed to identify the factor that contributed in packaging defect at manufacturing company and to suggest the solution to solve the problem of packaging defect at manufacturing company. The main factor of defect that occurs in packaging at this manufacturing company will be identified at the end of this study and suggestion also will be given to help this company to solve the problem based on the factor that has been found in this manufacturing company.

The effective way to reduce packaging defects will be obtained based on the interview, observation and collect data with the supervisor and employee that conduct the process of packaging at this manufacturing company. The scope of this research will be conducted at one of the manufacturing company located at Indera Mahkota, Kuantan, Pahang, Malaysia.
1.7 SIGNIFICANT OF STUDY

This study aims to identify the factor that contributed in packaging defect at a manufacturing company and give suggestion to this manufacturing company to minimize defects on their product packaging. This study will also give a lot of importance to help this manufacturing company to improve the quality of the product packaging. In addition, this study will also help small and medium-sized industrial companies to use this finding.

In addition, this study also will be able to maximize the profits of this manufacturing company, to reduce costs, time and to minimize defects on their product packaging. Other than that, this study also can be a guideline for other companies that faced the same problem in the future.

1.8 OPERATION DEFINITION

The purpose of this operational definition is used to define the importance of keyword and the term in the research.

Packaging

According to the Wikipedia which state that the packaging is the technology of enclosing or protecting products for distribution, storage, sale, and use.

Quality

Quality has been defined as fitness for use, or the extent to which a product successfully serves the purposes of consumers (Beverly et al., 2002).

Defect

According to Business Dictionary (2014) which is state that defect in the manufacturing area is about a non-conformance of a product with the specified requirements, for non-fulfillment of user expectations including the safety aspects.
Machines

According to Wikipedia, a machine is a tool containing one or more parts that uses energy to perform an intended action and can save manpower. It's also any equipment, computers, tools that required accomplishing the job.

Method

Method is a process to perform and the specific requirements for doing it, such as policies, procedures, rules, regulations and laws.

Material

A crude or processed material that can be converted by manufacture such as raw materials, parts, pens, paper, etc. used to produce the final product

Quality tools

Any type of device or tool that a used to support the quality of all products. It can take the shape of a chart, technique or strategy that supports quality management efforts.

Pareto diagram

The Pareto diagram is a graphical overview of the process problems, in ranking order from the most frequent, down to the least frequent, in descending order from left to right.

Ishikawa diagram

Ishikawa Diagram is a tool that helps to identify the causes of a problem (Luxinnovation G.I.E 2008)
1.9 EXPECTED RESULT

At the end of the study, the expected result is be able to identify the factor that contributed in packaging defect at manufacturing company and to reduce defects of the packaging in this manufacturing company. Besides that, the results from this study are expected to help this manufacturing company to produce packaging that meet quality standards, reduce the cost, time and maximize profits.

In addition, the expect results is based on the objectives of this study that to find the factors that contributed in packaging defect at manufacturing company and give the suggestion to this manufacturing company that based on the factors that occur and to reduce the defects on their product packaging.
CHAPTER 2

LITERATURER REVIEW

2.1 INTRODUCTION

This chapter was representing about the theoretical background of the past researcher from their journal. This chapter also about the literature review that shows the process of reading, analyzing, evaluating, and summarizing scholarly materials about packaging, importance of packaging, defect in packaging and also all the methods that be able to find a key factor of defect that occur in packaging and way or solution to reduce the defect will be discussed detail in this chapter.

Furthermore, this chapter also will show the overview of philosophy about the method that can help in reducing defects in the packaging. Among these is a Quality tool which is Pareto diagram and Ishikawa diagram, Total Quality Management, continuous improvement, PDCA Cycle, Poka-Yoke, Six Sigma, and Zero defects. Other than that, the factor that might be caused to the defect also will be discussed in this chapter such machine, human, and material. Then, the effective method will be chosen based on the phenomenon or situation of the manufacturing company and the interview feedback.
2.2 PACKAGING

Packaging is the container for a product encompassing the physical appearance of the container and including the design, colour, shape, labeling and materials used (Arens, 1996). Other than that, packaging also is a process of preparing items of equipment for transportation and storage and which embraces preservation, identification and packaging of products. According Panwar (2004) packaging is an act of containing, protecting and presenting the content through a long chain of production, handling and transport to their destination in good condition at the time of production. Its means packaging is a something that was designed to protect, preserve product from any damage or circumstances can alter or damage the product whether physical or biological damage and presents products more effectively to customer satisfaction.

2.2.1 Important of packaging

According to Abdalkrim and AL-Hrezat (2013), packaging is a serve as a silent salesperson and attracts the shopper's attention. It's because packaging is an important part of the branding process and it plays a role in communicating the image to identity of a company. So, packaging has an important role in marketing communications, especially from the point of sales and could be treated as one of the most important factors influencing consumer’s purchase decision. Then, packaging also can give a lot benefit to the company to maximize their profit and promote their product.

Besides that, packaging is an important integrative aspect of the product and often a critical factor in the success or failure of a given product (Schoell, 1985). It' because packaging is the best role for promotional and it can be used to attract customers' attention and encourage them to examine the product. According to Vidalles Giovannetti (1995), packaging is crucial, given that it is the first thing that public sees before making the final decision to buy. Packages use design, colors, shapes, pictures, and materials to try to influence consumer's perceptions and buying behavior (Lamb et al., 2004). Therefore, the role of packaging in the marketing communication is very important and should be improved in order to attract the attention of consumers and provide adequate value about the product.
Other than that, there are several important criteria in packaging should be watched in terms of color, typefaces (typography), description, company logo, name and address of the company, packaging design and layout of the packaging. Its means the company should be consider for all the criteria to make sure their product have satisfy the quality and customer satisfaction and also will maximize their profit.

2.3 DEFECT

According to the Cambridge Dictionary which is stated that the defect also can be define as a fault or problem with something or someone that will spoil them or causes them not to work correctly. Other than that, the defect also can be defined as the non-fulfillment of intended usage requirements. According to Dhafr et al., (2006), the defect is a deviation from specification or, in other words, the performance gap between a desired result and an observed result. Defects include the defective parts which unacceptable to pass the quality standard. A defect exists in either of two states; the defect either has already occurred, calling for defect detection, or is about to occur, calling for defect prediction (H. Lachajczyk and M. Dudek-Burlikowska, 2006)

Furthermore, the substantial defect will cause the significant of losses, especially to an organization, such as rejected on quality, wasting resources, time and so on. Consequently, it's will give the negative effect to the manufacturing company to maximize their profit and the company will faced a losses. Therefore, the manufacturing company must to concern about the problem occur from the defect and need to manage the problem correctly at the early stage from not become more serious. So, it will help the company to minimize cost, time, production and also can maximize the company profit.
2.3.1 Causes of Defect

Defects may happen in any stage of the transforming process, input, process, and also output. It's because each defect occurs due to errors in the process. Besides that, the defects of various sizes occur in the device during the manufacturing process (O. Kim 2013). Furthermore, defects also occur due to mistakes that have been made and can affect the reputation of an organization. Moreover, defects include the defective parts which unacceptable to pass the quality standard.

According to the Dhafr et al., (2006) defect is includes consideration that arising from machine faults, operators’ errors and any other operational sources. Besides that, the causes of defects also can be categorized into three types which are materials, human and machine. It's because, defects also consume significantly resources including the raw materials and labor used to produce the product, as well as extra labor and machine time to fix the defective part. According to Bon and Karim (2011) has state that there are four major factors that cause defects such as human negligence, less quality of raw materials, machines that need maintenances and work procedures. Other than that, defects also occur due to insufficient expertise in planning, designing products that are not right and not fair selection of raw materials.

2.3.2 Machine

One of the reasons that may contribute to the defects of a product is caused by machine. It’s because the machine runs 24 hours per day and defects may occur because of non-stop producing products. In addition, defects also occur because of the machines breakdown and the manufacturing company will face difficulties in the production of quality products. According to Martyn Enofe and Aimienroubiye (2010), has state that machines breakdown also will affect the profitability of a company. It’s because after the breakdown, the machine will not operate within its tolerances anymore, which will reduce the quality of the product.
Therefore, the company must to concern about the maintenance of equipment because it is very important and it also will be the one of the ways to reduce the defect rate. So, the maintenance should be performed regularly as a monthly, semi-annual or year, to make sure the machinery in a good condition and to control the defect to be the lowest. Besides that, the supervisor or the quality control departments also need to inform the mechanic if the problem of defects is always occurring frequently and it might be happen caused by the some machinery setting or a part goes wrong in the machinery. In addition, the use of machines that are not compatible with the product will cause the defect. This is because the use and selection of suitable machine is very important for reducing the defect.

2.3.3 Manpower

Another reason that may contribute to the defects of a product is caused by manpower. M. Dudek-Burlíkowska and D. Szewieczek (2009) have stated that defects was arise the most of the result of human errors. Employee, human is the main assets and very important to an organization. Defect by manpower might be occur because of the misunderstanding of instruction or interpretation, lack of communication and knowledge, lack of worker training and improper implementation in the task or job. Hence, all this will give a negative impact to the company to produces a quality product and will contributed to company losses.

Besides that, the defect caused by manpower also occurs because of the lack of skill and related knowledge, especially in using the technology or to handle the machines process in this modern era. That is because by using the high-tech machines, the company needs to hire the worker that has a professional knowledge to handle the machines. Furthermore, the knowledge is very important, without the knowledge, workers might be not managing well the job or production process and it will cause of defects. Therefore, the company must give the training to the employee to enhance their skills and knowledge in order to manage the machine correctly.
2.3.4 Material

Material also will contribute to the defects of a product and will influence the process of packaging. This is because, defect will give a negative impact on the quality of the material and it has a strong relationship between each other. For instance, the high quality of materials will produce the lower of defect in the product or packaging that will be produced. Its means that, material is very important to produces the quality product and also may contribute to the defects problem. Besides that, defect that occurs in product is caused of the materials used that not meet standard quality. Therefore, the company needs to concerns about the quality of the material, especially from the supplier and need to make sure the material that has been orders are in standard of quality and suitable for the product and machines that been used to avoid any defect from occurs by the material.

2.4 QUALITY

According to Rani et al., (2012) has state that quality have many assumptions from the simple definitions till the complicated ones. There are several definitions of the quality that has been listed below to explain the meaning of quality.

i. Quality is fitness for use (Juran, 1989).
ii. Quality is conformance to requirements (Crosby, 1996).
iii. Quality should be aimed at the needs of the consumer, present and future (Deming, 1986).
iv. Quality is the total composite product and service characteristics of marketing, engineering and maintenance through which the product and service in use will meet the expectations of the customer (Feigenbaum, 1991).
v. Quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs (ISO 9000).
Therefore, based on all the definitions above, the quality can be concluded as something that very important and more focused on customer. It's because quality is driven by customer satisfaction and also have become the principle definition of quality from a managerial perspective.

Other than that, quality also is comprises of all characteristics and features of a product which refers to satisfy a given requirement. It means the quality is very important and should conform to specifications, customer satisfaction, and value of the product, people, service, and processes (Chandani and Gupta, 2014).

2.5 QUALITY TOOLS

Quality tools can be defined as a methods that use to analyze and improving products. According to Paliska,G et al., (2008) has state that are the most fundamental quality control tools that were first emphasized by Kaoru Ishikawa, professor of engineering at Tokyo University and the father of “quality circles.” It's consist of seven QC tools namely histograms, check sheets, Pareto diagrams, cause-and-effect diagram, control chart, scatter diagram, and flowcharts. The concept behind the seven basic tools came from Kaoru Ishikawa, a renowned quality expert from Japan. These quality tools are mainly used to obtain and analyze data for situations when the objectives are known and rely on visual displays. The main objective of quality tools is less variation in the product. It mean to create a quality product, must minimize the variation in the specification of the product.

According to the Jacowski,(2006) has state that quality control tools are used by many organizations in order to monitor quality initiatives in their products or services. It's because each tool may be used to solve a particular problem and can be used in a number of ways. Other than that, the key to successful problem resolution must have the ability to identify the problem, use the appropriate tools based on the nature of the problem, and communicate the solution quickly to others. It's very important to the company to find the solution to solve the problem in company and also can reduce loss of company and can maximize the company profit.