

A STUDY ON DEFECT RATE OF PACKAGING IN MANUFACTURING
COMPANY

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SUPERVISOR'S DECLARATION

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I hereby declare that the work in this thesis is my own except for quotation and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of other degree.

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DEDICATION

This thesis is dedicated to my parents and my family and also my friends who support me all the way during my study.

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Blessings of Allah S.W.T, Alhamdulillah for the opportunity and good health for me to complete this research study to qualify for the award of degree. Firstly, I am grateful and would like to express my sincere gratitude to my supervisor Datin Hajah Mazita binti Mokhtar for her germinal ideas, invaluable guidance, continuous encouragement and constant support in making this research possible. I appreciate her patience in reviewing my work, helped me to improve and complete my research. I also sincerely thanks for the time spent proof reading and correcting my many mistakes.

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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 Indera 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

Kajian ini adalah kajian mengenai kadar kecacatan pembungkusan di syarikat pembuatan. Tujuan kajian ini adalah untuk mengenal pasti faktor yang menyumbang dalam kecacatan pembungkusan di sebuah syarikat pembuatan dan memberi cadangan untuk menyelesaikan masalah kecacatan pembungkusan. Kajian ini merupakan satu kajian kes dan telah dijalankan di salah sebuah syarikat pembuatan yang menghasilkan rempah dan menjalankan proses pembungkusan di Indera Mahkota, Kuantan, Pahang. Data tersebut diperoleh daripada pemerhatian, temu bual dan pengumpulan data di syarikat pembuatan. Data dan maklum balas temu bual itu akan dianalisis dengan menggunakan perisian Minitab dan menggunakan kaedah rajah Pareto dan rajah Sebab dan Kesan. Hasil kajian menunjukkan bahawa tenaga kerja adalah faktor utama yang menyumbang kepada kecacatan pembungkusan untuk syarikat ini. Hasil daripada kajian ini dapat membantu syarikat untuk mengetahui punca kepada masalah ini dan mengurangkan kecacatan itu daripada faktor yang telah dijumpai.

TABLE OF CONTENTS

	Page
SUPERVISOR'S DECLARATION	ii
STUDENT'S DECLARATION	iii
DECLARATION	iv
ACKNOWLEDGMENT	v
ABSTRACT	vi
ABSTRAK	vii
TABLE OF CONTENTS	viii
LIST OF FIGURES	xi
LIST OF TABLE	xii
 CHAPTER 1 INTRODUCTION	
1.1 Introduction	1
1.2 Problem Background	3
1.3 Problem Statement	4
1.4 Research Objective	5
1.5 Research Questions	6
1.6 Scope of Study	6
1.7 Significance of Study	7
1.8 Operational Definition	7
1.9 Expected Result	9
 CHAPTER 2 LITERATURE REVIEWS	
2.1 Introduction	10
2.2 Packaging	11
2.2.1 Importance of packaging	11
2.3 Defects	12
2.3.1 Causes of defect	13
2.3.2 Machine	13
2.3.3 Manpower	14
2.3.4 Material	15

2.4	Quality	15
2.5	Quality Tools	16
	2.5.1 Pareto Diagram	17
	2.5.2 Cause and Effect diagram	18
2.6	Total Quality Management	20
	2.6.1 Continuous Improvement	21
	2.6.2 PDCA Cycles	22
2.7	Zero Defects	24
2.8	Six Sigma	24
2.9	Poka Yoke	25
2.10	Conclusion	27

CHAPTER 3 RESEARCH METHODOLOGY

3.1	Introduction	28
3.2	Research Design	28
	3.2.1 Type of study	29
	3.2.2 Type of data	29
3.3	Data Collection Technique	30
	3.3.1 Population and Sampling	30
	3.3.2 Instrument Development	31
	3.3.3 Research Process	32
3.4	Data Analysis	33
3.5	Conclusion	34

CHAPTER 4 RESULT AND DISCUSSIONS

4.1	Introduction	35
4.2	Total Packaging Defects	36
	4.2.1 Type of packaging defect	37
4.3	Method	38
	4.3.1 Pareto Analysis	38
	4.3.2 Cause and effect diagram	40
	4.3.2.1 Manpower	41
	4.3.2.2 Machines	43
	4.3.2.3 Method	44
	4.3.2.4 Environment	45
4.4	Process Improvement	45

4.4.1	Manpower	46
4.4.2	Machines	48
4.4.3	Method	48
4.4.4	Environment	49
4.5	Conclusion	49

CHAPTER 5 CONCLUSION AND RECOMMEDATION

5.1	Introduction	50
5.2	Conclusion and research finding	50
5.3	Limitations of study	52
5.4	Recommendations	53
5.5	Conclusion	54

REFERENCES	55
-------------------	-----------

APPENDICES	60
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LIST OF FIGURES

Table No.	Title	Page
2.1	Example of Pareto diagram	18
2.2	Example of Causes and Effect diagram	19
2.3	Advanced PDCA Cycle	23
2.4	PDCA Cycle in Continuous Improvement	23
3.1	Research Process	32
4.1	Total Packaging Defect in year 2014 from Jan until Sept	36
4.2	Type of Packaging Defect of Product A in year 2014	37
4.3	Pareto diagram of type of packaging defect in year 2014	39
4.4	Cause and Effect diagram of cause of less weight & folded plastic	40
4.5	Manpower	41
4.6	Machines	43

LIST OF TABLE

Table No	Title	Page
4.7	Process Improvement	46

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 the 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 Vidales 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-Burlikowska 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. It means that, material is very important to produce 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.

Then, for the inexperienced personnel might do best by starting with the Pareto chart and the cause and effect diagram before tackling the use of the other tools. Hence, those two tools are used most widely by quality improvement teams (Gitlow, Oppenheim, Levine, 2005). It's because this tools is easy to learn and handle and are used to analyze solutions to existing problems.

2.5.1 Pareto Diagram

Pareto analysis is the one of the seven basic tools of quality control. Pareto analysis, also called as a Pareto diagram, Pareto chart, Pareto principle and it also known as the "80/20 Rule". Besides that, these Pareto principle is suggested by management consultant Joseph Juran in 1950 after observing that a high proportion of quality issues result from only a few causes and named after Italian economist Vilfredo Pareto was determine a rule and refers to the concept that in many systems, roughly 80% of the output, problem or topic of issue is caused by 20% of the inputs.

Furthermore, Pareto diagram is a histogram or bar graph of the data from the largest frequency to the smallest. The purpose of the Pareto diagram is to shows the highest frequency of occurrence of the causes and others. Besides that, Pareto chart is used to graphically summarize and display the relative importance of the differences between groups of data (Simon, 2010). The lengths of the bars represent frequency or cost which is time or money, and are arranged with longest bars on the left and the shortest to the right. In this way the chart visually depicts which situations are more significant. The example of Pareto diagram will be shown below in the figure 2.1.

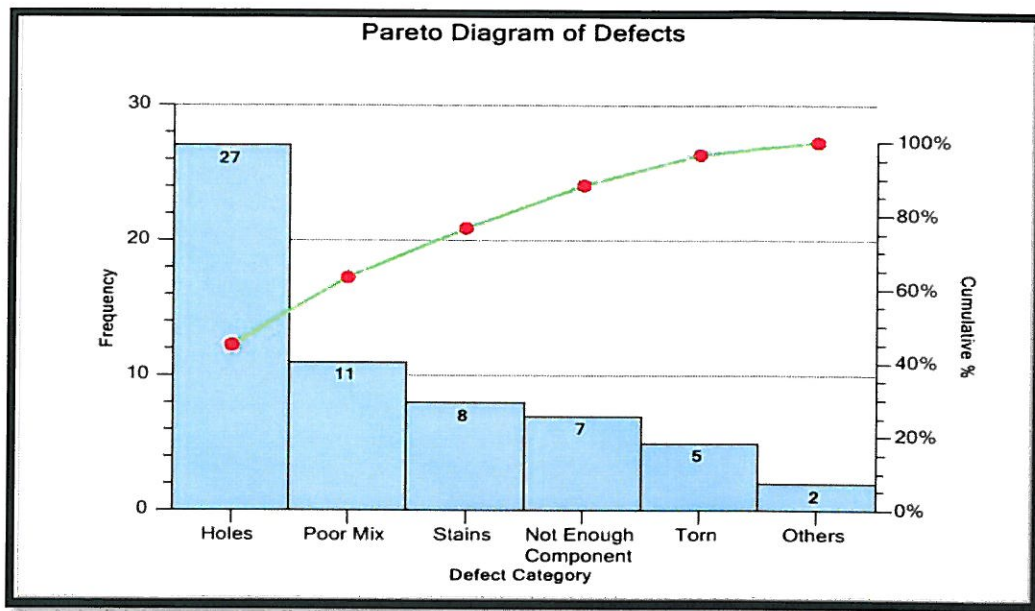


Figure 2.1 Example of Pareto Diagram

2.5.2 Cause and effect diagram

Diagram cause-and-effect also known as the fishbone diagrams, herringbone diagrams, Ishikawa diagrams are diagram showing the causal created by professor Kaoru Ishikawa in the 1960s indicated that the source event occurs. The Cause and Effect diagram was originally developed as a quality control tool yet it also can be used for the same technique in the other ways. Besides that, Ishikawa Diagram is a tool that helps to identify the causes of a problem (Luxinnovation G.I.E 2008). It's also has an overall view of the causes that generate the problem with a structured representation of all the causes that produce the effect.

Other than that, this method also can make it possible to tackle the causes, to correct defects and provide solutions by employing corrective actions. Solanki and Prof A.Bangar (2013) have stated that the cause and effect diagram is a tool that shows systematic relationship between a result or a symptom or an effect and its possible causes.

Furthermore, the goal of Ishikawa diagram is to illustrate in a graphical way the relationship between a given outcome and all the factors that influence this outcome. It's also to identify the causes of problems in order to correct them. Other than that, there are several reasons for choosing this method as the cause and effect tools. It is because this method assists the generation of ideas for problems causes and also serves as a basis for solution finding. According to the Kollengode, (2010) which is stated that there are four steps to constructing a cause and effect diagram:

Step 1: Define the problem to be solved

Step 2: Identify the key causes of the problem

Step 3: Identify the reasons behind the key causes

Step 4: Identify the most likely causes

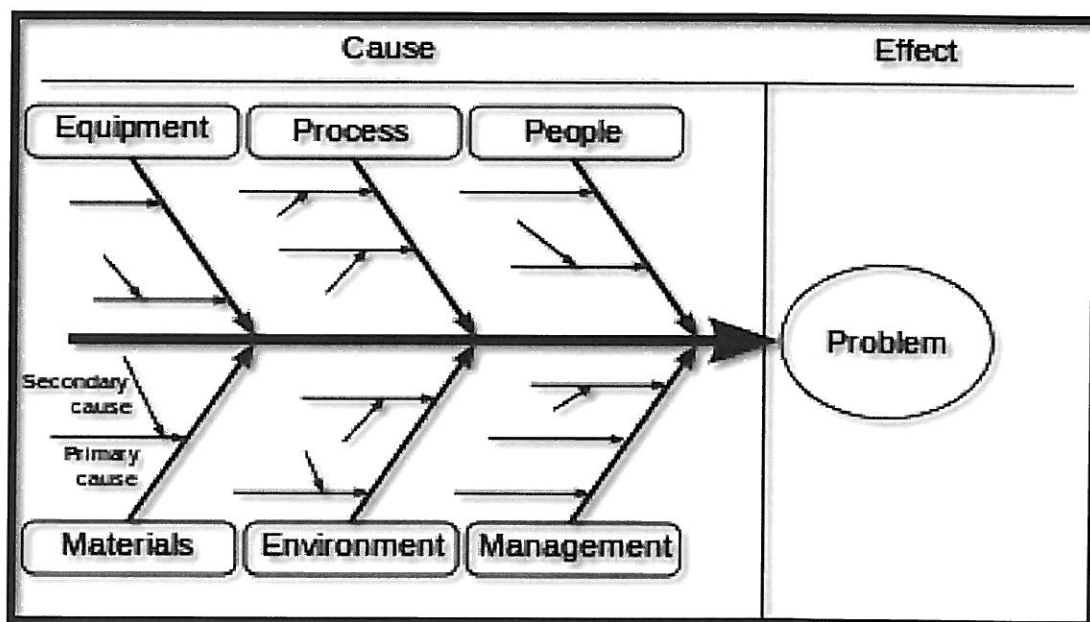


Figure 2.2 Example of Cause and Effect diagram

2.6 TOTAL QUALITY MANAGEMENT

Armand V Feigenbaum is an American quality control expert and businessman that was devised the concept of total quality control later known as Total quality Management (TQM). According to Rani et al., (2012), Total Quality Management is a system implemented to reduce defects in finished products with the goal of achieving zero defect products. These systems are requiring timely data on defective products, rework costs, and the cost of honoring warranty contracts. In addition, TQM is an approach for continuously improving the quality of goods and services delivered through the participation of individuals at all levels of an organization (Pfau, 1989). Other than that, TQM is a way of organizing and involving the whole organization which is every department, every activity and every single person at every level. It's also to ensure that the management adopts a strategic overview of the quality and focuses on prevention rather than inspection.

Furthermore, TQM also has become increasingly prevalent as one of the management strategies in ensuring customer satisfaction and loyalty, improving products and service quality and reinforcing continuous improvement (Osman, et al., 2009). Besides that, TQM is more than a program; it is a way of business management for the whole organization. It is a holistic corporate philosophy including three fundamental principles of 'Total' as participation of every person and every department; 'Quality' as meeting customer needs and expectations; and 'Management' as enabling conditions for total quality (Whyte & Witcher, 1992). Thus, TQM is defined as a comprehensive management philosophy which provides continuous improvement to all functions of an organization, and it is achieved when the subject of total quality is utilized from the acquisition of resources to customer service (Kaynak, 2003).

Besides that, TQM also is emphasizes that customer requirements and business goals are inseparable. It requires cooperation among every part and demands fundamental changes in every aspect of the organization. According to Yusuf et al., (2007), TQM also requires continuous improvement not only in products/services quality but also in all operations for creating an organizational quality culture. It is

important to establish a positive TQM environment in the whole organization in order to implement TQM.

2.6.1 Continuous Improvement

According to (Gersten and Riss, 2002, p. 41) Continuous improvement (CI) can be defined as the planned, organized and systematic process of ongoing, incremental and company-wide change of existing practices aimed at improving company performance. Continuous improvement also can be defined as a never-ending process of improvement that performed by everyone in an organization. Other than that, continuous quality improvement process assumes and requires that a team of experts together with the company leadership actively use quality tools in their improvement activities and decision making process (Soković et al, 2009). In addition, a quality team is comprised of management members, managers, and operators that were established with the purpose of coordinating the continuous improvement activities.

According to (Caffyn and Silano, 1999; Mann and Kehoe, 1994; Oakland et al, 1994) reported that continuous improvement has a positive impact on performance measures such as productivity, quality and delivery. It mean that continuous improvement is very important way to ensure that the company always produces the quality of product in term of packaging and it also can maximize the company profit.

Other than that, there are several activities and behaviors that facilitate and enable the development of continuous improvement. it's include problem-solving, plan-do-check-act (PDCA) and other CI tools, policy deployment, cross-functional teams, a formal CI planning and management group, and formal systems for evaluating CI activities. The most popular technique for continuous improvement is Shewhart Cycle of Deming Cycle, known as PDCA cycle (Hagemeyer and Gershenson, 2006).

2.6.2 PDCA Cycle

According to Anderson (2011), PDCA (Plan, Do, Check, Act) Cycles refers to the PDCA that was developed by Dr. Walter Shewhart, one of the top ten quality gurus. Besides that, the PDCA cycle is also known as deming cycle or Shewhart cycle although it was developed by a colleague of Deming, Dr.Shwhart (Kumar, 2013).

According to Soković et al., (2009), the PDCA-cycle is used to coordinate continuous improvement efforts. Besides that, PDCA cycle is always looking for better methods of improvements .Hence, it emphasizes and demonstrates that improvement programs must start with careful planning, must result in effective action, and must move on again to careful planning in a continuous cycle. Other than that, it is a strategy used to achieve breakthrough improvements in safety, quality, morale, delivery cost, and other critical business objectives.

A PDCA-cycle consists of four consecutive steps or phases, as follows:

- Plan - analysis of what needs to be improved by taking into consideration areas that hold opportunities for change. Decision on what should be changed.
- Do - implementation of the changes that are decided on in the Plan step.
- Check - Control and measurement of processes and products in accordance to changes made in previous steps and in accordance with policy, goals and requirements on products. Report on results.
- Act - Adoption or reaction to the changes or running the PDCA-cycle through again. Keep improvement on going.

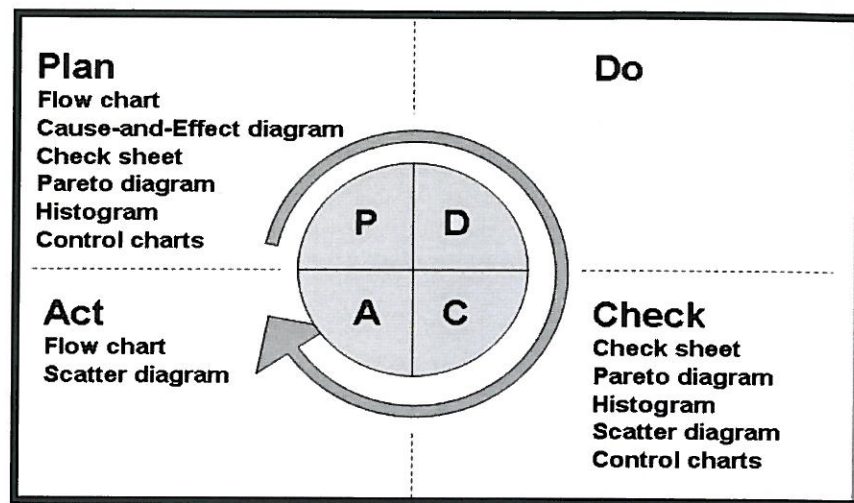


Figure 2.3 Advanced PDCA Cycle

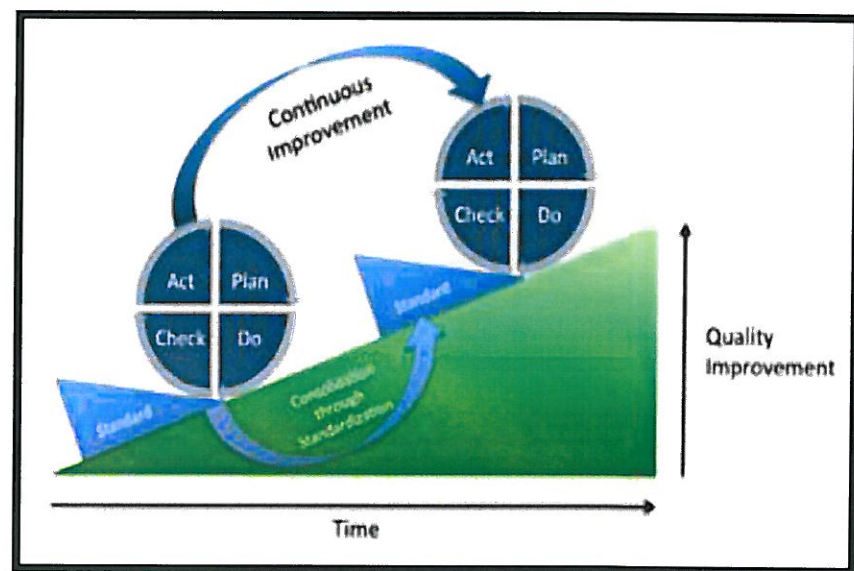


Figure 2.4 PDCA Cycle in Continuous improvement

2.7 ZERO DEFECTS

Philip B. Crosby was introduced "zero defects" to define the goal of a quality program as the elimination of all defects and not the reduction of defects to an acceptable quality level (Anderson, 2009). Besides that, Zero defects also will be defined as a way of thinking and doing that reinforces the notion that defects are not acceptable, and that everyone should "do things right the first time". It means the idea of philosophy of zero defects also will increase profits both by eliminating the cost of failure and increasing revenues through increased customer satisfaction.

Furthermore, Zero Defects is also a management tool aimed at the reduction of defects through prevention. It is directed at motivating people to prevent mistakes by developing a constant, conscious desire to do their job right the first time (Halpin, 1966) — Zero Defects: A New Dimension in Quality Assurance. Other than that, the objective of Zero defects is only where the process' ability to predictably generate output within the specification limits is improved instead of widening the specification limits.

Besides that, the concept of zero-defect also can be utilized in any manufacturing environment to improve quality and reduce cost (Wang, 2013). However, implementation of zero-defect requires the right conditions. Therefore, there are two reasons to pursue zero-defect quality products and processes which are safety and customer expectation.

2.8 SIX-SIGMA

Six sigma is a set of tools that can be used to improve the process and products of a company. Six sigma also focuses on improving quality by helping organizations to produce products and services better, faster and cheaper (Mahanti and Antony, 2005). It means that six sigma is very important in a company to produce a good quality product and also can reduce the cost, time and increase their company profit.

Other than that, Six Sigma is a management philosophy that is based on the theory that reduction in defects is a better approach to lowering costs and customer loyalty (Jacowski, 2006). It realizes the fact that defects are expensive. To gain a competitive edge, developing a high quality product at the right cost is essential for customer satisfaction and profitability.

Besides that, Six Sigma also is a philosophy of running an organization with a focus on eliminating the defects through the fundamental process of the knowledge. It also can improve the service or product that offered to customers.

According to Antony and Banuelas (2001), the purpose of six sigma is to improve the quality of process outputs by identify and removing the causes of defects (errors) and also minimize changes in manufacturing and business process. Other than that, the main goal of six sigma is to reduce defect. Six Sigma also can help the company to highlight the process improvement opportunities through the systematic measurement. Hence, to reduce the defect, the company must implementing technology or six sigma system to help the company increase their productivity and maximize profit.

However, to implementation six sigma systems is not simple and these might have a negative consequences if it applied in the wrong project. It's because these strategy was requires many tools and teamwork. Furthermore, it also includes from the managerial quality check, equipment and even the computer software

2.9 POKA YOKE

According to the Dilton and Andrew, (1989) which is stated that the Poka-Yoke was introduced by Shigeo Shingo in 1961; and this concept was formalized and adopted as part of the Toyota Production System. Besides that, these Poka yoke also refers to a Japanese concept that invented by Shigeo Shingo in the 1960s for Toyota as a means to prevent the company for making any errors (Mcmeans, 2011). In 1963, Shigeo Shingo was establishing the poka yoke name and was being translated as a "resistance to errors" (avoid (yoker) errors resulting from inattention (poka)).

Other than that, the Poka yoke is a quality assurance technique developed by Japanese manufacturing engineer Shigeo Shingo. This method, in other words, is to prevent defects and errors originating in the mistake (M. Dudek-Burlikowska and D. Szewieczek, 2009). Furthermore, the method of Poka-Yoke is based on convenience that it is not acceptable to produce even very small quantities of defective products. According to the S. Patel et al., (2001) has stated for the companies, defect is not only challenge but necessity to produce the products in 0% defect. Furthermore, the concept of Poka yoke is to makes sure that quality products are made in the right environment by preventing any errors or finding them and fixing them as early as possible.

According to the (Robinson, 1997), the aim of poka-yoke is to eliminate defects in a product by preventing or correcting mistakes as early as possible. Moreover, this Poka-yoke also has been used most frequently in manufacturing environments. This is because the selection of appropriate and constant improvement strategies is an important function to the company and the company need the special emphasis by put the prevention strategy.

Besides that, Poka-Yoke technique also can be applied both to prevent causes, which will result in subsequent occurrences of errors and to carry out inexpensive control determining whether to adopt or reject the product. It is not always 100% probability elimination of all errors. Other than that, the Poka yoke method also will be analyze to the process of product defect formation and has been noted that between a mistakes the resulting from the defect is a potential possibility.

2.10 CONCLUSION

In this chapter, it shows several methods that have been used to identify the main factor of defects and to reduce the defect. The defect is something that's very dangerous to the company. It's because defect will give a negative impact to the company and will bring loss to the company. Therefore, all companies must be concerned to all defects that occur to the company, even the small defect. This is due to minor defects would be great if the company does not control defects at an early stage.

Besides that, each company must know the main causes of defect that occurs in the company. It will easier for the company to solve the problem. In this chapter, there are several methods used to identify the main causes of defects occurring and to reduce the defects that occur in the packaging, such as Pareto diagram and causes and effect diagram. In this study, the effective method will be chosen based on the phenomenon, the situation and the interview feedback from the manufacturing company.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter will discuss about the methodology of this research. This chapter also contains a description of the methodology that will be used in this research study to formulate the problem to be investigated, research design, type of study, type of data, data collection technique, population and sampling, develop the instrument design, process and data analysis through a written report. Therefore, the method that have been elected will be generated carefully and accurately to reach the study objective and research question

3.2 RESEARCH DESIGN

According to the Awang et al., (2008) which is state that the research design is a process of creating an empirical test to support or to refute a knowledge claim. The research design also is a conceptual structure, plan or strategy within which research would be conducted. Other than that, this research design also important to determine the success or failure of the study. Furthermore, methodology also called as research design that include a blueprint, plan, and framework or as a guide. It is enabling the researcher to step back from any personal feelings or biases to study specific issues.

3.2.1 Type of Study

The type of research in this study is a case study method. This case study was performed at one of the manufacturing company that produces spices and conducts a process of packaging in Indera Mahkota, Kuantan, Pahang. The case study can be defined as a research strategy that will investigate the real-life context of the phenomenon. Besides that, case study also can be defined as an account of an activity, event or problem that contains a real or hypothetical situation and includes the complexities that would encounter in the workplace. The case study method will be used in this study because it can provide detail information and the description that researchers want to study.

Other than that, there are two types of research methodologies in collecting information which are quantitative and qualitative. In this research, qualitative method will be used to conduct this research and to achieve the objective of this research. Qualitative data is the data that mainly comprised of words, sounds or image. This research design is will include with the interview and observation to the peoples that have the desired information in the manufacturing company. Other than that, collecting data of defects in packaging that has been recorded in this manufacturing company also will be taken. Qualitative research is gathers information that is not in numerical form. For example, diary accounts, open-ended questionnaires, unstructured interviews and unstructured observations. This method is provides more detailed about description to the interviewer and observation.

3.2.2 Type of Data

The type of data that will be used in this study is primary and secondary data. In the primary data collection, data were obtained through an interview and the observation technique. The observation and interview is the techniques to collect the data by asking questions to the supervisor and employees that conduct the process of packaging and have the desired information.

On the other hand, the secondary data is data gathered from secondary sourced that obtained from several of resources such as internet, journal, articles, books, report and company's website. The findings from secondary data are then used with the primary data to fulfill the objectives of this study and also useful to finish this research. However, this secondary data usually is the backup plan if the data collection from the company resulted in failure.

3.3 DATA COLLECTION TECHNIQUE

Data Collection is an important aspect of any type of research study. Data collection is a systematic approach to gathering information from a variety of sources to get a complete and accurate picture of an area of interest. Besides that, data collection also is a process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. The data collection component of research is common to all fields of study including physical and social sciences, humanities, business, etc. While methods vary by discipline, the emphasis on ensuring accurate and honest collection remains the same. Inaccurate data collection can impact the results of a study and ultimately lead to invalid results. In this study, Data collection will be accomplished by using data collection instruments like the interview and observation method to the supervisor and employees that conduct the process of packaging and have the desired information at the manufacturing company.

3.3.1 Population and sampling

In this study, the population is focuses on the manufacturing company that produces spices and conduct packaging process in Pahang, Malaysia. For this research, the sample has been conducted at one of the manufacturing company that produces spices and packaging process which is located at Indera Mahkota, Kuantan, Pahang. The target respondents for the interviewee section in this study are the employee that conducted the packaging process, supervisor and manager that have the desired information in this manufacturing company.

3.3.2 Instrument Development

Data instrument that is used in obtaining data is by an interview and observation method to the manager, supervisor and employees that conduct the process of packaging and have the desired information at the manufacturing company in Kuantan, Pahang. Other than that, the data of defect in packaging that have been recorded in this manufacturing company also will be taken in order to get an accurate data.

Furthermore, observation is the process of analyzing, applying and learning; alternatively it can also be defined as the act of attentive watching, or noticing of a situation. Besides that, the observation technique was require the researcher present personally to obtain the data and the data will be obtained directly in the phenomena and the situation in the manufacturing company. In this research study, the observation technique is used to see the process of packaging, type of defect in packaging and the defect rate that occur in packaging.

Other than that, an interview session also will be conducted in order to collect the relevant information. The input from this interview sessions can help to make an analysis and conclusion. Moreover, these interviews are used to gather information regarding an individual's experience and knowledge, his or her opinions, belief and demographic data. Furthermore, this interview is a particularly useful for clearly understanding the true story and also useful to investigate issues in an in-depth way. In addition, an interview is a two way conversation whereby the questions are asked by the interviewer to obtain information from the interviewee.

In this study, a personal interview will be carried out with the manager, supervisor and employees that conduct the process of packaging and have the desired information at the manufacturing company in Kuantan, Pahang. These interviews are conducted in order to collect further and in-depth information to fulfill the objectives of this study. Other than that, a list of questions regarding the topic discussed will be prepared prior to the interview.

Besides that, in this research the interview will be conducted through face-to-face interview. The face-to-face interview will be more appropriate to be carried out in this study because the data or the information will be explained is clearer and it also will be easier for the question and answer session. In addition, using face to face communication can helps people express the feelings, ideas much better. Moreover, the responses from the person that been interview can be given immediately without misunderstanding.

3.3.3 Research Process

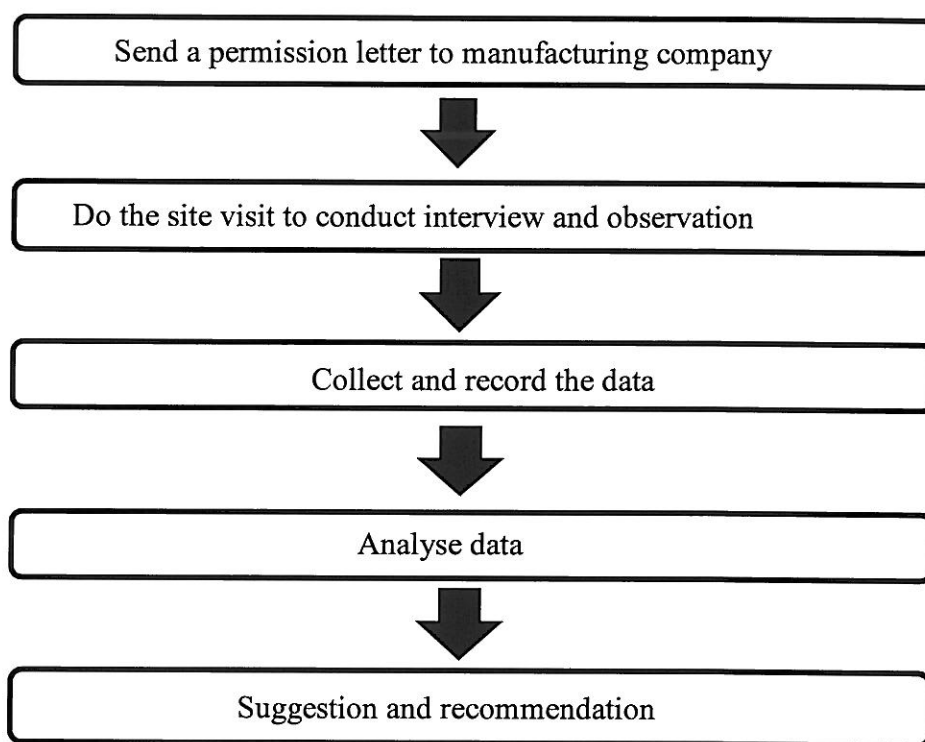


Figure 3.1 Research process

In this study also shows the process to collecting data in the manufacturing company. Firstly, must send a letter of authorization to conduct a study on the manufacturing company by using the email. After get the permission from the company, the site visits will be conducted to the selected manufacturing company in order to conduct the interview and observation about the process of packaging and the defect occur in packaging. An interview session involves with the supervisor and employee

that conduct the process of packaging and have the desired information at one of the manufacturing company at Indera Mahkota, Kuantan, Pahang. All the possible question in the scope of study will be ask. Next, collecting data of defect in packaging that have been recorded in this manufacturing company also will be taken. Then, all the outcomes of data collection from the interview, observation and data collection will be recorded and the process of analyze data or information will be continued by researcher. Lastly, give the suggestion and recommendation to this manufacturing company to solve the problem.

3.4 DATA ANALYSIS

Analysis of data is a process of inspecting, cleaning, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision making. Data analysis also has multiple facets and approaches, encompassing diverse techniques under a variety of names, in different business, science, and social science domains. Moreover, this form of analysis is just one of the many steps that must be completed when conducting a research experiment. Data from various sources is gathered, reviewed, and then analyzed to form some sort of finding or conclusion. Besides that, data analysis is a practice in which raw data is ordered and organized so that useful information can be extracted from it. The process of organizing and thinking about data is a key to understanding what the data does and does not contain. For this reason, it is important to pay attention when data analysis is presented, and to think critically about the data and the conclusions that will be drawn.

In this study, the computer software analysis that will be used is Minitab software. Minitab is a software package that helps to analyses data. Minitab software also is the statistical software that guides through the hypothesis tests, control charts, process capability, measurement systems analysis, and regression. Once all the information was gathered from the data collection, observation and interview session with supervisor and employee that conduct the process of packaging in the manufacturing company, then all these data will be transferred into the Minitab software.

Other than that, this Minitab software also contain the quality of tools such as Pareto diagram and Ishikawa diagram that will be used to find out the key factor of defect that occurs in packaging. Pareto diagram will be used to shows the highest frequency of occurrence of the rejection factor and other. Pareto diagram also indicating that 80 per cent of the problems stem from 20 per cent of the causes. Besides that, the Ishikawa diagram also will be used to identify the root cause for the overall defect that occurs in packaging. Then, all the causes that was being identify will be solve by giving the suggestion to the company to improve or solve the problem.

3.5 CONCLUSION

As a conclusion, this chapter was provides the details of the methods and procedures used to collect information for the study. This chapter also discuss various aspects related to the study methodology includes research design, type of study, type of data, data collection, sampling, research instrument, process and data analysis that used in this research. Other than that, Interviews and the review of literatures as well as documents review have been used as data collection research instruments. The analysis of the result from the methodology applied in this study is presented in the next chapter.

CHAPTER 4

DATA ANALYSIS (RESULT AND DISCUSSION)

4.1 INTRODUCTION

These chapters present the research findings and the results of the statistical analysis conducted on the data. In this chapter, the result findings will be described based on the objective of the research and the methodology used in the chapter 3. At the first stage is collected the data about the type of packaging defect that occurs in this manufacturing company. The data only focus for the one product packaging namely product A and the data collection is in year from month of January until September to assess the defect rate in year. Product A is a priority product by this company and this product always get the highest demand from the customer. Besides that, the observation and interview session also will be conducted in order to collect further and in-depth information about the packaging defect. This method also will help to analyze and get the research finding.

In this chapter also represent the data analyze using the Pareto diagram and Cause and effect diagram to analyze all the data and the information. At the end of this chapter will be propose the action and suggest the solution in the process of improvement from the examine the type of defect rate in packaging and give suggestion to the improvement process and to reduces the packaging defect rate in this manufacturing company

4.2 TOTAL PACKAGING DEFECT

This is data analysis from the manufacturing company that produces spices and packaging process that show the total packaging defect of the product A in year 2014 from month of January until September. The total packaging defect can be seen in this figure below.

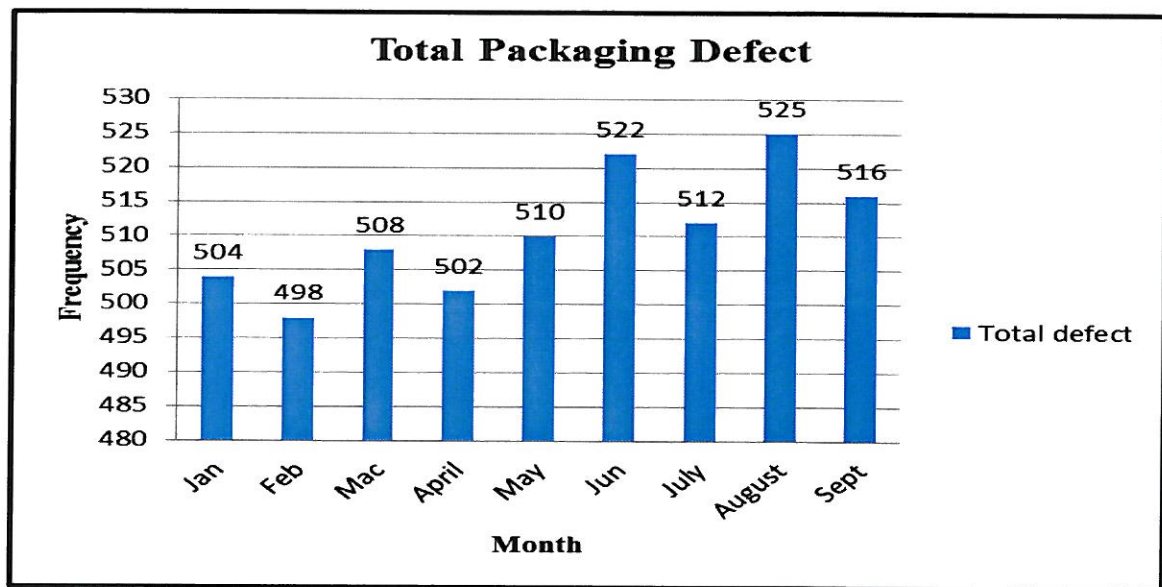


Figure 4.1 Total Packaging Defect in year 2014 from Jan until Sept

The graph shows the total packaging defect rate in year 2014 from January until September. This graph also shows that this manufacturing company was have the problem in packaging defect that increase and still not be solved. In Jan shows the total defect was 504 decreases in Feb was 498, increase in Mac 508, decrease in April 502, and back to increase in May 510 ,Jun was 522 and decrease in July 512, increase in August 525 and decrease in sept was 516. This graph is not consistence in every month because the production of this product produces depend on the customer and retailer demand in the market. Therefore, the packaging defect also depends on the production that produces in this company and also depends on the several factors.

4.2.1 Type of packaging defect

Apart from the data on total packaging defect for the product A, the researcher also collect the data for the type of packaging defect that is always be issued by this manufacturing company until now. This manufacturing company had faced for four type of packaging defect namely less weight, folded plastic, leaked plastic and other defect that occur in the packaging. All the type of packaging defect can be seen in the diagram below.

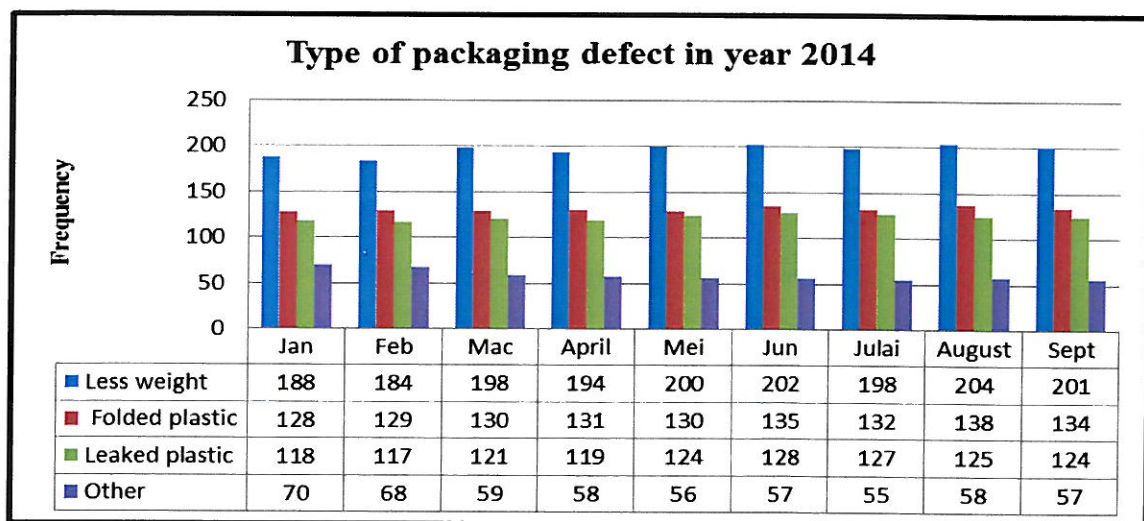


Figure 4.2 Type of packaging defect of product A in year 2014

As seen in the diagram above, shows that the type cause of packaging defect rate namely less weight, folded plastic, leaked plastic and other defect that occur in the packaging of product A in year 2014 by month of January until September. Mostly, the higher type cause of packaging defect rate each month happen because of the less weight and follow by folded plastic, leaked plastic and lastly is other. All this type always occur in this manufacturing company because this company does not know the root cause of packaging defect and not to concern about this. Thus, it will give a negative impact to the company such as loss the company profit.

4.3 METHOD

Method is a process that been chose and used to identify the factor that contributed to packaging defect from the type of packaging defect in this manufacturing company, to know the root cause of the packaging defect in this manufacturing company and also to analyze ,improve and give suggestion/recommendation to this manufacturing company .

4.3.1 Pareto Analysis

Pareto diagram analysis is the first method used to assess the cause and frequency source cause of the type of packaging defect in year 2014 by month of January until September. The Pareto principle states that a problem can be solve by focus on solving the most frequently occurring causes. Furthermore, the purpose of the Pareto diagram is to shows the highest frequency of occurrence of the causes .There are four type cause of packaging defect in this manufacturing company. Diagram below shows the Pareto diagram analysis for the packaging defect of product A in year 2014 by month of January until September.

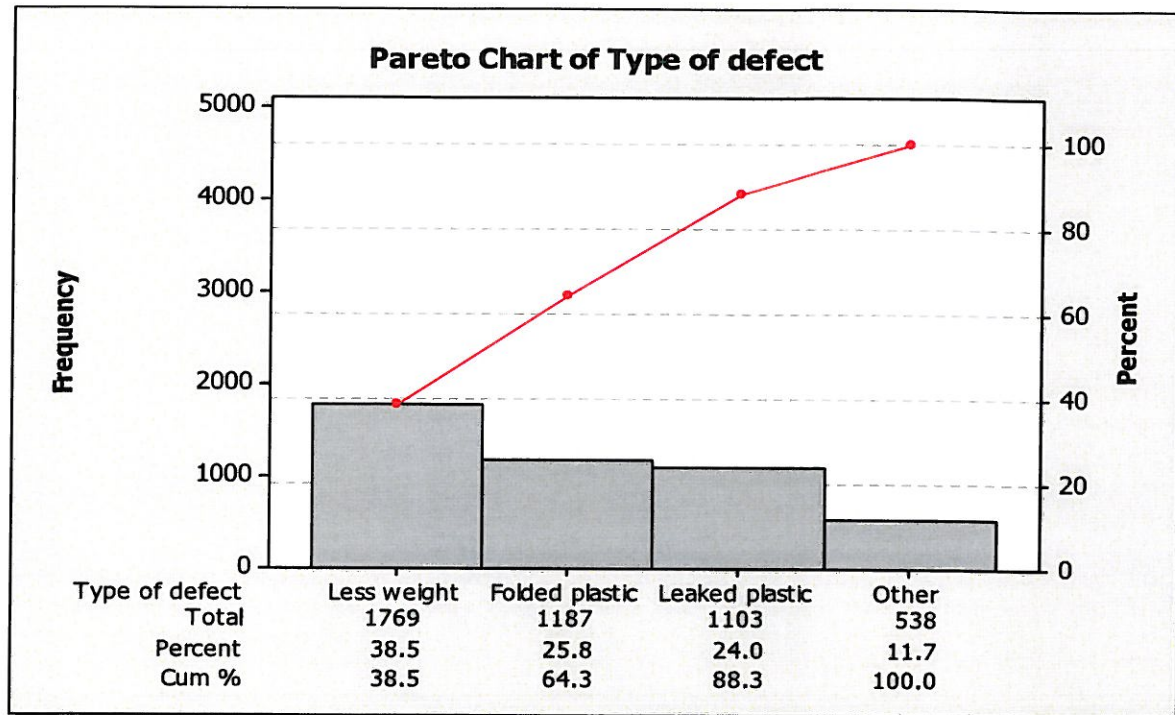


Figure 4.3 Pareto diagram of type of packaging defect in year 2014

Pareto diagram above shows the type cause of packaging defect and frequency of causes result in packaging defect rate of product A in in year 2014 by month of January until September. There are four type of packaging defect namely less weight, folded plastic, leaked plastic and other. The higher packaging defect occur is by type of less weight, where the total packaging defect is around 1769 with the frequency and cumulative is 38.5% follow by folded plastic was 1187 with the 25.8% frequency and 64.3% in cumulative. Then it follows by type of leaked plastic was 1103 with the 24.0% frequency and 88.3% in cumulative. The lower packaging defect occur is by type of other, where the total packaging defect is 538 with the frequency 11.7% and cumulative in 100.0%. Based on the Pareto diagram, the researcher will choose two higher of the type packaging defect. Then, through the two higher of type packaging defect that has been selected, the researcher will identify the root cause of this problem occur by using the second method namely cause and effect diagram and to try solve it by suggest the solution based on the root cause that was been find.

4.3.2 Cause and effect diagram/ Ishikawa diagram

Cause and effect diagram or Ishikawa diagram is the second method used after do the observation and interviews session and get all the information that contributed to the problem in type of packaging defect in this manufacturing company. This method used to analysis and to identify the causes of a problem in order to correct them. Other than that, this method also will be used to identify the root cause for the two higher of packaging defect that has been identify in the Pareto diagram. Figure below shows the cause and effect diagram / Ishikawa diagram for the packaging defect that occur in this manufacturing company.

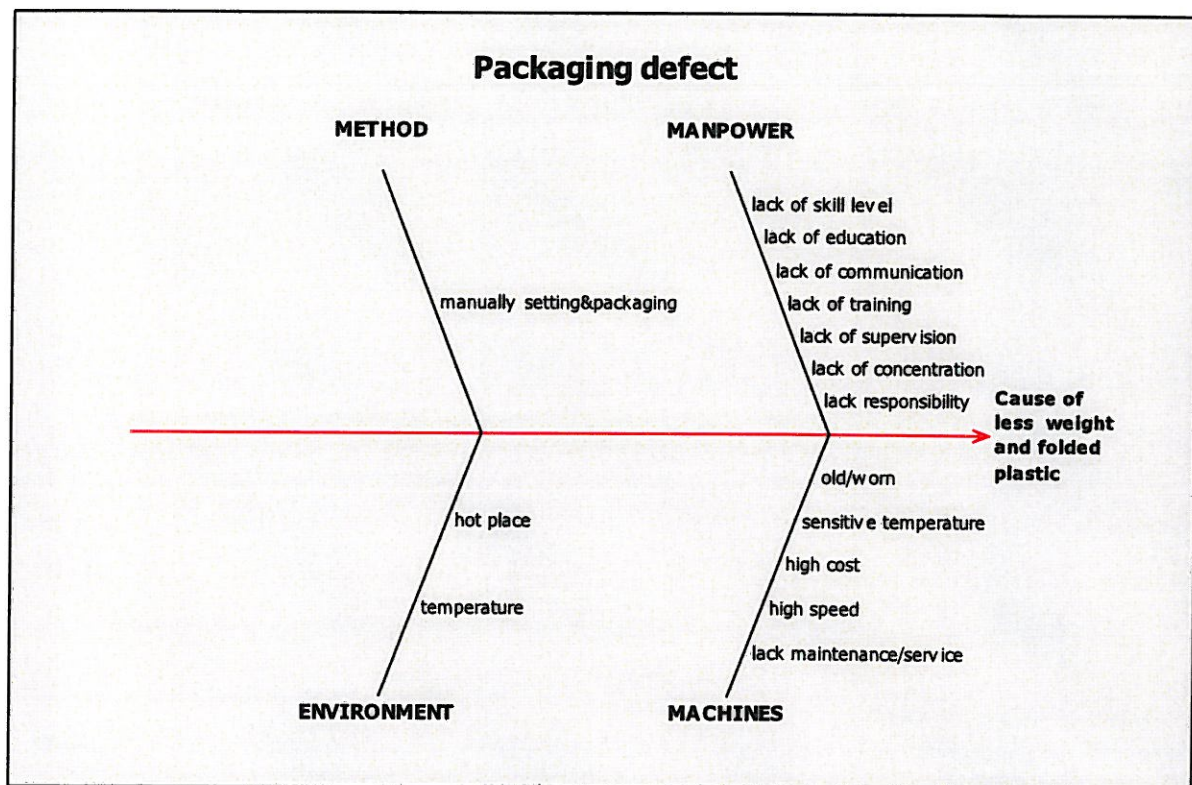


Figure 4.4 Cause and effect diagram of cause of less weight and folded plastic.

Based on the figure 4.3.2 above shows that the higher problem occurs by the type of packaging defect namely less weight and folded plastic from the first method analysis in Pareto diagram and it happen because of the four factors that show in the second method in cause and effect diagram. The factor that contribute to the higher packaging defect in less weight and folded plastic are occur by machines, manpower, method and environment. Each factor will be explaining detail in the next page and to make it clear about the factor that contribute to the cause of less weight and folded plastic happen in this manufacturing company.

4.3.2.1 Manpower



Figure 4.5 Manpower

Based on the observation and interviews session, the manpower is the major factor that contributed to the packaging defect in less weight and folded plastic by this manufacturing company. That is because from the analysis by using the cause and effect diagram shows the higher reason is causes by manpower that contributed with seven causes namely lack of skill level, lack of education, lack of communication between

workers, lack of training, lack of supervision, lack of concentration and lack of responsibility. Mostly, the worker in this manufacturing company does not have skill to handle machines, knowledge, experience and high education.

Furthermore, most of the worker not understands the English language and this will make difficult for worker to understand the guidebook about machine Volpack and to use each function in the machine. That is because this company is not concern for the standard recruitment to the worker and mostly the worker just have the qualification in PMR or SPM and this company also hired the foreigner worker form Bangladesh and the practical student to cut cost of this company. Other than that, based on observation and interviews, some of the worker not concentrate and does not have any training to handle the machine, process and also lack of supervision.

Besides that, lack of communication between workers also happen in this manufacturing company. Communication is very importance to manufacturing company to avoid the misunderstanding during the process and to handle the machine. All this cause will be contributed to the packaging defect and other problem in this manufacturing company if this company not concern about this and solve it.

4.3.2.2 Machine

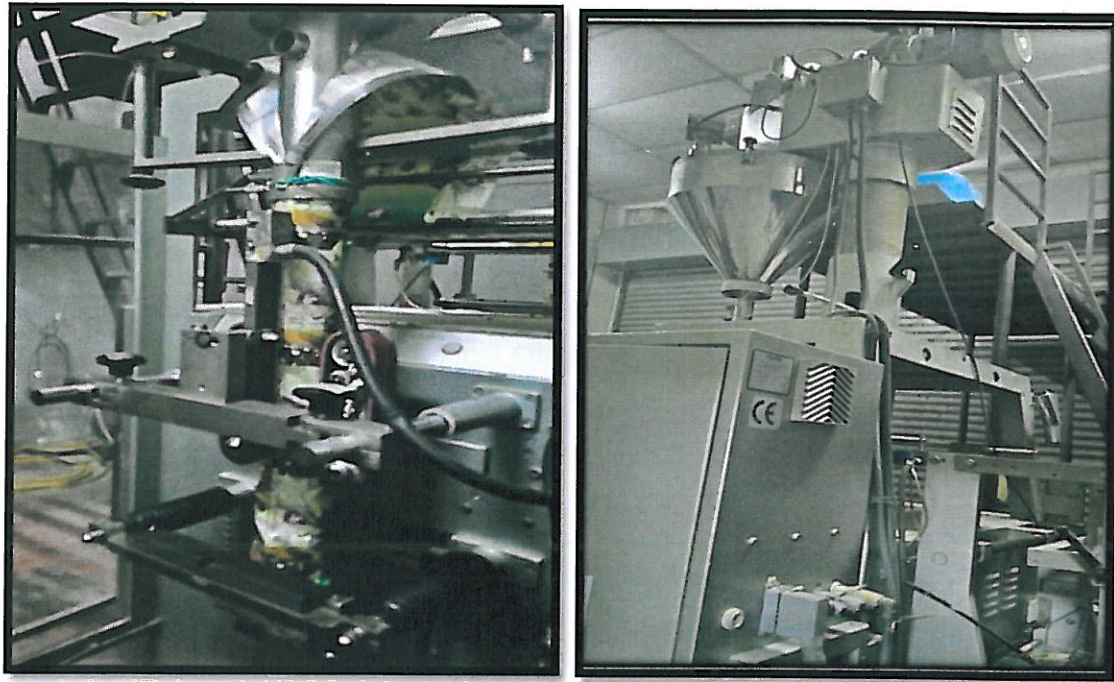


Figure 4.6 Machine

Based on the observation and interviews session, the machines is the second factor that contributed to the packaging defect in less weight and folded plastic by this manufacturing company. That is because from the analysis by using the cause and effect diagram shows the second reason is causes by machines that contributed with five causes namely lack of maintenance and service, high speed, old/worn, high cost and sensitive of temperature. This manufacturing company used the Volpack machines for the packaging process. The owner of the company imported the machine from Switzerland. So far, there are only three Volpack machines available at manufacturing company in Malaysia which is in this manufacturing company, Nestle and Adabi manufacturing company. This Volpack machine gives benefits to the company in increasing the production rate. However, this machine required high maintenance cost. Therefore, once the machine broke, it required high cost to repair. That is because this machine is difficult to get the spare parts in Malaysia. The spare part must to be order from Switzerland and it taking a long time. If the machine out of order, the packaging

have to be carried out manually in order to prevent any delay of the deliver to customers.

Other than that, this machine is lack of maintenance and service because the owner wants to save the cost of company profit. Furthermore, this machine has been used in long time and also high in speed and need to be setting every time to used it properly. Besides that, this machines also very sensitive temperature and will be placed in place that have the air conditioner only to protect the machine from breakdown. This machine will be broken if not used and handle it properly. This entire problem will contribute to the packaging defect and it will be a serious problem if the company not concern and solve it.

4.3.2.3 Method

Based on the observation and interviews session, the method is the third factor that contributed to the packaging defect in less weight and folded plastic by this manufacturing company. That is because from the analysis by using the cause and effect diagram shows the method that used in this manufacturing company is used manually method in setting and packaging process that will contributed to the packaging defect. Mostly, this manufacturing company only used the manually method in setting the machine such operate the machine in packaging, process to take raw material such flour to the machine Volpack by using manually filling tank and it will slow to the process of packaging, take a lot of energy of worker and will affect the productivity, production, time and also will contributed to the packaging defect.

Other than that, this manufacturing company also used the manually method in record the data such not record data using any technology or software and also used the manually method in packaging process like put the sticker price and expired date. This method that company used also will contribute to the packaging defect and it will be a serious problem if the company not concern or improve the method and solve it.

4.3.2.4 Environment

Based on the observation and interviews session, the environment is the last factors that contributed to the packaging defect in less weight and folded plastic by this manufacturing company. That is because from the analysis by using the cause and effect diagram shows the other reason is causes by environment that contributed with two causes namely temperature and hot place. Environment is very importance to make sure all the process, machine, employee and the product always is in good condition. That is because the process of packaging is used the machine and this machines that been used is very sensitive in the hot place. If the air conditioner was broken, this will affect the machine and also will contribute to the packaging defect in less weight and folded plastic

Based on the observation, when the air conditioner broken or blackout happen in this manufacturing company, this company just use the fans to the machine and still continuous the process of packaging and the defect will contributed higher. Besides that, this company is very hot. All of this problem also will contribute to the packaging defect and it will be a serious problem if the company not concern and solve it.

4.4 PROCESS IMPROVEMENT

Process improvement is processes that can be used to improve and suggest to this manufacturing company to reduces or solve the problem in the packaging defect by less weight and folded plastic .This process improvement also will be a suggestion to the manufacturing company to improve it. This manufacturing company can be used this process improvement to reduce or solve the problem that contributed to the packaging defect. Other than that, this process also will help the company to increase their profit, productivity and other. They are several improved process in terms of manpower, machine, method and environment.

No	Factors	Propose action for improvement
1.	Manpower	<ul style="list-style-type: none"> i. Training worker ii. Standard recruitment iii. Brainstorm/ meeting iv. Supervision v. Test the understanding worker to handle machine. vi. Explore each function in the machine. vii. Create a new guidebook of machine Volpack in Malay language
2.	Machine	<ul style="list-style-type: none"> i. Hired maintenance ii. Service
3.	Method	<ul style="list-style-type: none"> i. Operate machine in automatic system ii. Change filling tank automatic
4.	Environment	<ul style="list-style-type: none"> i. Add more air conditioner ii. Improve layout

Table 4.7 Propose action for improvement

4.4.1 Manpower

The process improvement that will be suggested to improve by send employee for training to handle the machine and improve the skill. Process improvement by given training to the worker will increase the productivity of worker and the worker also will have their experience and at the same time can training worker to improve their skill and not repeat the same mistake again.

Besides that, the process improvement that will be suggested to improve is by creating a new guidebook of machine Volpack in Malay language. This manufacturing company must create a new guidebook of machine Volpack in Malay language to make the worker easier to use it. That is because, most of the worker of this manufacturing company not understand the English language and this guidebook of machine volpack is very importance to be a guide to the worker to handle the machine and explore each

function of the machine. Furthermore, this machine is very high technology and if the machine was used in properly and correctly it will help the company to reduce the problem in packaging defect and also will increase the productivity, production and also increase the company profit.

Other than that, the process improvement that will be suggested to improve is by increase the standard of recruitment of the worker. This manufacturing company must concern about the qualification of the worker or staff because standard recruitment is very importance to make sure the worker have the knowledge and it will be easier to train the worker to do the job. Furthermore, the education, experience and skill worker will give the advantage to the company to improve the productivity and increase company profit.

In addition, the process improvement by giving the reward to the worker also will make the worker to be more proactive and like the job and also more responsibility to concentrate or focus to the job. This will give an advantage to the manufacturing and also will increase the profit and at the same time will reduce the defect or problem that been contribute by the employee.

Besides that, the other process improvement is by doing the preparation, meeting or brainstorm with the worker before start to do the job to given the right information and instruction to worker. This improvement will make sure the worker not miss the information, know what should they do and to avoid the misunderstanding between them.

Other than that, the other process improvement is by the supervisor. The supervisor must always monitor their worker. That is because if the worker do the mistake or have difficult to do the job, the supervisor must help and show the right instruction to solve it problem. Then, the supervisor must test the worker understanding for handle machine to make sure the worker fully understand. This process improvement also will control the defect or other problem from occurs.

4.4.2 Machines

The other process improvements that will be suggested are to improve the process of maintenance and service. This company must provide one position of maintenance to service or repair this machine if it is broken. These machines must be serviced when they show any problem such as in speed or occur a defect in packaging in the early stage to avoid it from breakdown or being broken. Besides that, this machine should be maintained properly and placed in the appropriate place with suitable temperature like a place that has the air.

Furthermore, this machine has been used in long time and also high in speed and needs to be set every time to use it properly. Besides that, these machines are also very sensitive to temperature and will be placed in a place that has an air conditioner only to protect the machine from breakdown. This machine will be broken if not used and handled properly. This entire problem will contribute to the packaging defect and it will be a serious problem if the company does not concern and solve it.

4.4.3 Method

Then, the other process improvements that will be suggested are to improve the method that has been used in this manufacturing company. This company needs to plan the system properly such as operate the machine in an automatic system especially the process to take raw material such as flour to the machine Volpack and also change the filling tank to automatic in the future. This can improve the process of packaging and also increase the production, productivity of workers, time and save energy of workers.

In addition, this company also can improve the method that the company was using to record the data manually to change and use the technology such as using any software or record in a computer and also do the graph or Gantt chart that will help and be easier for the company to detect any problem and it clearly can be seen.

4.4.4 Environment

Then, the other process improvements that will be suggested are to improve the environment in this manufacturing company. Environment is very importance to make sure all the process, machine, employee and the product always is in good condition. So, this company needs to add more air conditioner at least two to be a backup if the one of the air conditioner was broken to make sure the machine in the good condition.

Besides that, this manufacturing company need to setting or change the layout of the places to be more systematic to make the good ventilation. The layout for the place needs to improve especially in the process of packaging to smooth the process. The layout for every activity process for starting until the finishing should be in systematic ways. So, it is easier to the worker to do the job. This will bring a benefit to this company and also will increase the productivity, production and increase the company profit.

4.5 CONCLUSION

As a conclusion, this chapter was present details about the analysis of the research to achieve the objective of this study. This chapter also shows the result analysis by data collection, observation and interview session with the company and this chapter also shows the analysis by using Pareto diagram and causes and effect diagram to identify the factor of packaging defect in this manufacturing company. Then, this chapter also shows the suggestion by researcher from the factor that had been found. Next, in the chapter five would be present the conclusion and recommendation of this study.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

This chapter will discuss on the conclusion about this research study and will make some recommendation based on the analysis of the result in this research. The researcher will conclude about the objective of this research that been analyze in previous chapter and make some discussion then come out with the overall conclusion and the limitation to complete this research study. For the recommendation part, the researcher gives recommendation to this manufacturing company and for the future research.

5.2 CONCLUSION AND RESEARCH FINDING

The purpose of this research study is 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 .Based on the findings of the research study in the previous chapter, this research will be concluded that there are four factors that contributed to the packaging defect for the higher causes in less weight and folded plastic that always occur in this manufacturing company.

For this research study can be conclude that the manpower is the major factor that causes in less weight and folded plastic to the packaging defect in this manufacturing company. Based on the observation, interviews and method in causes and effect diagram that researcher used shows that manpower is the major factor that causes by lack of skill level, such to handle machine, lack of training, such no training given to the workers and this company do not test the understanding worker to handling machine, lack of supervision, lack of communication between worker, lack of concentration, lack of responsibility, lack of education such worker not understand the English language and this will make difficult for worker to understand the guidebook about machine Volpack and to use each function in the machine.

On the basis analysis it has been conclude that all the causes by the manpower factor are very importance to be concern by this manufacturing company to solve it. So, this company needs to do the process improvement such by send employee for training to improve skill, test worker understanding to handle machine, create a new guidebook of machine Volpack in Malay language and explore each function in the machine Volpack.

In this research study can be conclude that the second factor that also will be a cause in less weight and folded plastic to the packaging defect in this manufacturing company are by machine. Machine is the second factor that causes by the lack of maintenance and service, high speed machine, high cost, old/worn and machine is sensitive temperature. So, the company needs to ensure the machine in a good condition by hired maintenance and service the machine.

Then, the factor of method also will be a cause in less weight and folded plastic to the packaging defect in this manufacturing company. Method also will be a factor that causes by used manually method in setting such operate the machine in packaging, process to take raw material such flour to the machine Volpack by using manually filling tank and it will slow to the process of packaging, take a lot of energy of worker and will affect the productivity, production and time. So, the company needs to plan the system properly, operate the machine in automatic system and also change the filling tank automatic in the future.

For the other factor the researcher can be conclude that factor of environment also contributed to the cause in less weight and folded plastic to the packaging defect in this manufacturing company. Environment also will be a factor that causes by temperature and hot place. Environment is very importance to make sure all the process, machine, employee and the product always is in good condition. That is because this machine Volpack is very sensitive in the hot place and must to take in the placed that have air conditioner to ensure the machine in the good condition. If the air conditioner was broken, this will affect the machine and also will contribute to the packaging defect in less weight and folded plastic. So, this company need to add more air conditioner at least two to be a backup and need to setting or change the layout of the placed in a good placed and more systematic to make the ventilation.

Finally it can be conclude that the company must be seriously concern and take action for all the factor that would find in this research study to help this company reduces their problem in the packaging defect and also will increase their profit. Besides that, the researcher also be conclude that using this method of Pareto diagram and causes of effect diagram also will help this company to find the root causes of their company problem and also help this company to solve it by this root cause. Furthermore, it a simple method that this company can use and also not a complicated method to understand and be apply and not take a cost.

5.3 LIMITATIONS OF STUDY

For complete this research study, the researcher had to face a lot of limitations and barriers before, during and after the study is conducted. This is because the research had limitation in time and the barriers because to search the journal or article to do this research also will take the time to understand, to get the best and suitable journal or article that related to this research study and sometime the journal had difficult to understand and the language or the English level is very high to understand and it will take a long time to read and understand it.

In addition, the researcher also had faced the limitation in time and cost to search the company that want to give cooperation with researcher to do this research in their company. This is because this research study is about the case study in the packaging defect that had the researcher to study detail about the company problem that contributed to the packaging defect. Then, the researcher also had difficult and limitation to get the complete data by the company. This is because the company data is a private confidential that it difficult to get.

Besides that, the researcher also had difficult to do the case study to understand and to choose the best method to this research study in the short of time. That is because it is difficult to understand in the limitation of time to observe and know the detail about the company problem in packaging defect.

Other than that, the researcher also had difficult to do this research study because it actually need fully commitment and need a lot of time, energy, cost of budget too which is sometime that well beyond of personal budget. It is because the researcher had to go to the company in many time to observe, interviews to get the data and the researcher also have to go to company to shows the research study in the company and to convince company with the suggestion to solve the company problem in the packaging defect that researcher do to this company.

5.4 RECOMMENDATION

For the future study or research, the researcher was recommending for those of outside researcher to study more on this title and maybe can use a better method that related with this title. This is because by this research also can be a reference or guidelines for manufacturing company that has face a same problem to used it and solve the problem. In this study for the recommendation, the manufacturing company should be taken seriously in all the factor that researcher found in this research by the company and should solve it to make the company reduces the problem in packaging defect especially reduce the defect by less weight and folded plastic.

Besides that, for the future the researcher was recommend for the company to hired an education employee especially employee that know and understand the English language and also have a skill and experience. In addition, the researcher was recommending for the company to increase the standard recruitment to make sure the employee that company hired is in qualification and has knowledge. Although it take a bit cost to the company but in the long term in the future it will give a lot benefit to the company and also will can cut cost and improve productivity this company.

For the future, the researcher was recommend for this company to always monitor the machines condition to make sure the machine in the good condition to used. If the machine had any signal or shows any problem at the early stage, the machine must be service to avoid it from breakdown or broken. That is because machine is very important to operate the process of packaging and to make the process smooth and it will reduces and control the defect rate in packaging and will increase a profit of company.

Other than that, for the future the researcher was recommend for the company to improve the method in this company by using a technology that already have and also explore each function in the machine and also used any software like Minitab or other to collect or record data and do the checklist to shows the graph or other that make work easier to identify any problem occur and easier to solve it.

5.5 CONCLUSION

As a conclusion, the objective of this research study is 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. In this chapter was discussing detail about the overall of the finding in this research. This chapter also discuss about the limitation or barriers in this research study to complete it and then discuss about the recommendation for the future research

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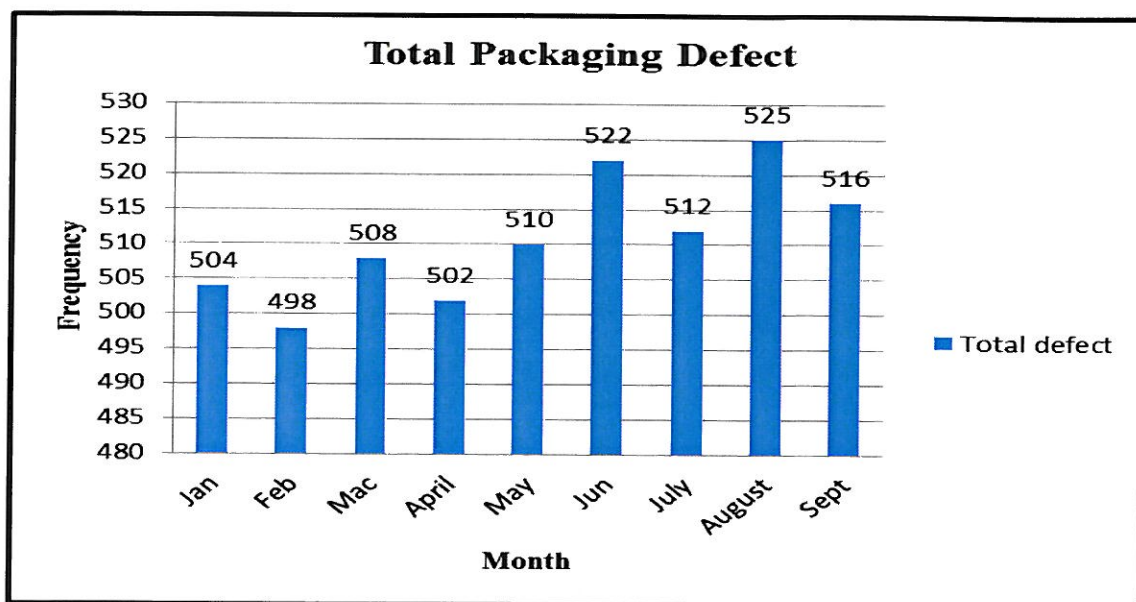
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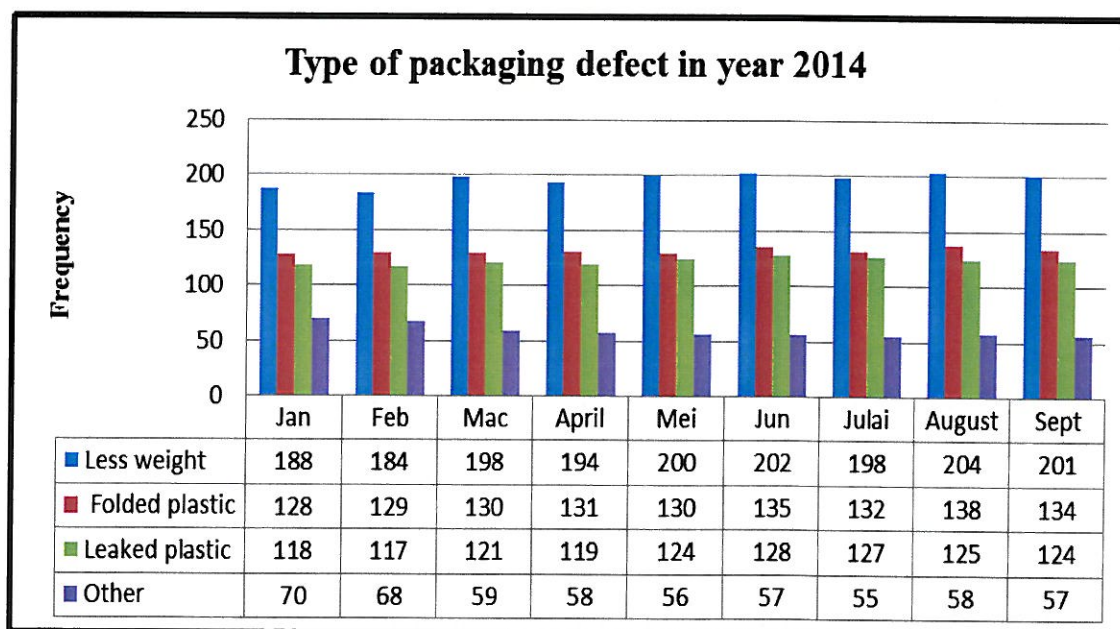
APPENDICES

Interview Question

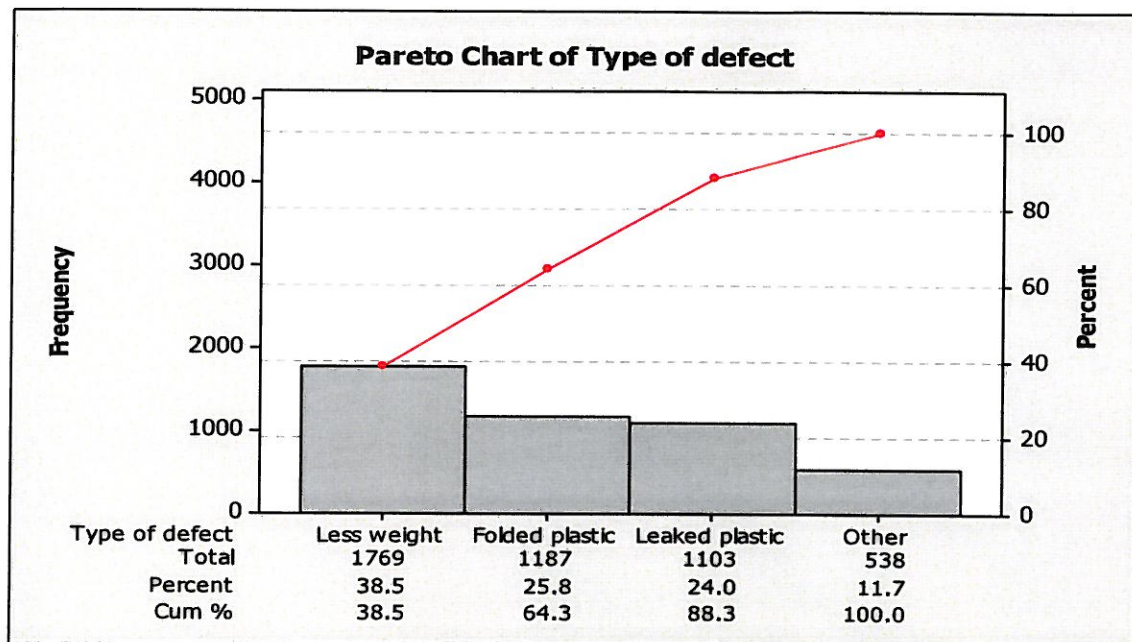
1. What type of defects in packaging that always occurs in this company?
2. Does this company know the root cause of this problem occurs? Why/how
3. What is the method that has been used by this company to identify the root cause of this problem?
4. Does the company is priority on quality such as quality in the packaging? Why/what
5. Does this company provide training or courses in process of packaging or to handle machine to the employee? Why/what/how
6. What type of employee that company taken such as in age, education, experience?
7. Does any problem that involves in the machine? What/why
8. How many time that machine are breakdown and been service in a month? why
9. Does the material, method or environment are influence of the defect of packaging? What/why/how
10. How does the company overcome this problem?



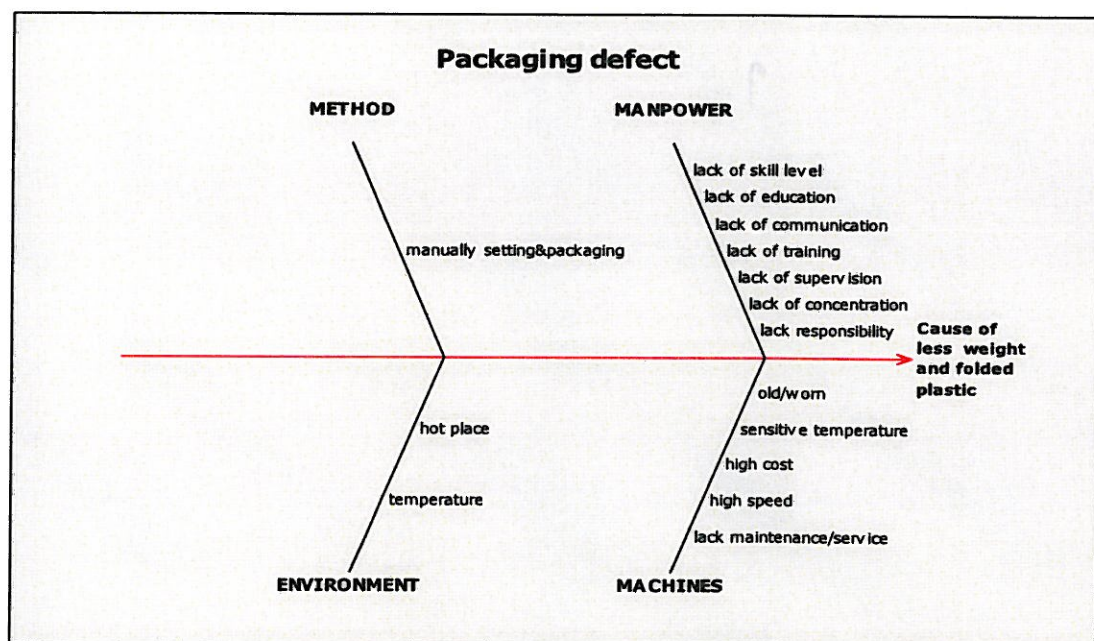
Total Packaging Defect in year 2014 from Jan until Sept



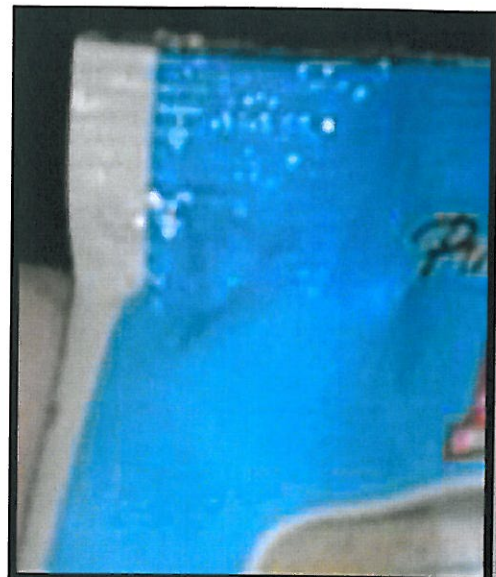
Type of Packaging Defect of Product A in year 2014



Pareto diagram of type of packaging defect in year 2014



Cause and Effect diagram of cause of less weight & folded plastic



Example type of packaging defects

