CHAPTER I INTRODUCTION

I.1 Background

In producing goods or products, there are always two certain conditions either they are good or bad. According to both conditions that appear, each of them has their own criteria. The perfect product would be a win for everyone. Of course, there are no perfect products, but there have been some awfully good ones. It is always associated with the fit between products and the human user, but products also suffer from poor performance and overly high prices, unreliability, difficult maintenance, crude manufacturing, ugliness, ostentatiousness, unnecessary complexity, representation of people or places users do not like, and destruction of natural beauty and future health (James L. Adams, 2011).

All products could be improved, and everyone have evidence for this in their personal experiences. After they have used a product for a while, they become critical of its specific details and can think of ways to make it better. Whatever the situation will be in the future, product quality will be essential to business success. Increasing product quality adds to the pride and satisfaction of employees as well as the reputation of the company. Improved product quality, however, brings added value, increases competitive ability, does not necessarily add to cost, and leads to higher demand. (James L. Adams, 2011).

“Quality” means those features of products which meet customer needs and thereby provide customer satisfaction. In this sense, the meaning of quality is oriented to income. The purpose of such higher quality is to provide greater customer satisfaction and, one hope, to increase income. However, providing more and/or better quality features usually requires an investment and hence usually involves increases in costs. Higher quality in this sense usually “costs more” (Joseph M. Juran, 1999).

There is strong relationship between quality of product and inspection activities. Where, inspection activity is a critical examination of something that is directed to

some predetermined goals. This inspection is to compare and determine the suitability of a product to its specifications (Thomas Telford, 1997). And followed by the quality assurance inspection which is defined as "All the planned and systematic activities implemented within the quality system that can be demonstrated to provide confidence that a product or service will fulfill requirements for quality". While quality control inspection is defined as "The operational techniques and activities used to fulfill requirements for quality" (www.qualitygurus.com).

The inspection and testing functions are key elements of the production process. Without accurate and specific criteria for determining that the manufacturing or service product meets the customer's requirements, we expose the organization to uncontrolled, inefficient, and expensive processing as well as negative perceptions from customers (criteria of bad product). These resulting performances can be minimized—if not eliminated—by preproduction and service evaluations (Joseph M. Juran, 1999).

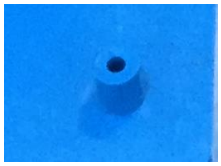
PT. ABC is one of a company in Indonesia which producing several kinds of products such as electronic equipment for military, equipment ICT (Information & Communication Technology), electronic equipment for navigation systems, electronic equipment for railway, renewable energy and electronic equipment. But from the various types of products manufactured, one of the most request number to produce is E-KTP Reader which is include in the category of ICT equipment.

Figure I.1 E-KTP Reader

E-KTP Reader is a tool to read and verify the personal data stored in the E-KTP chip. By using the E-KTP Reader, the E-KTP card can be read and verified against the holder to provide guarantees that the card is used properly by the entitled holder. E-KTP Reader is capable of displaying the data stored in the E-KTP card on the accompanying display and verify the holder independently (standalone) without the need to connect with other devices. In addition, E-KTP Reader is able to transmit data that has been read into the PC (personal computer) via the USB connection [www.len.co.id].

Based on the E-KTP production in 2016, defect products are produced during the final assembly in PT. ABC. Some defects had been solved with changing the design or materials, but there are three main defects which still occurs independently. Every material has its own criteria to be concluded as defect product or passed product, based on specifications which set by the company. Table I.1 shows defect material and passed material from each type of defect which mostly occurs in E-KTP Reader.

Table I.1 Defect product and passed product from 3 types of defect

No.	Type of Defect	Defect Product	Passed Product
1.	Mounting Bolts's holes broken		
2.	Casing broken caused by bolt pierced		
3.	Touchscreen display cracks		

PT. ABC had already try some efforts to handle these problems, but actually never been really solve yet. Based on observation and the data from company, there is only one inspection activity which is placed in the very last stage. The observation had been done in 5 days of work, where the company sets its target to produce 20 products in a day, with 100 samples for being analyzed. From that condition, many products are not detected as defect product or rejected, and then pass to the next stage until they found those defects when the final assembly process has already finish. It makes the company produces defect product, because there is no anticipation before the defect happens. Figure I.2 describes the day-by-day defect of products in 5 days of works.

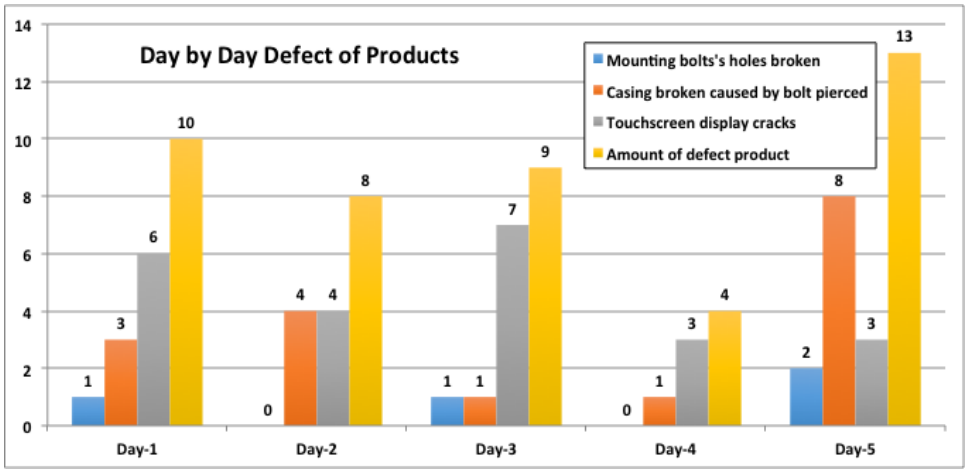


Figure I.2 Day by day defect of products in 5 days of work with 100 samples

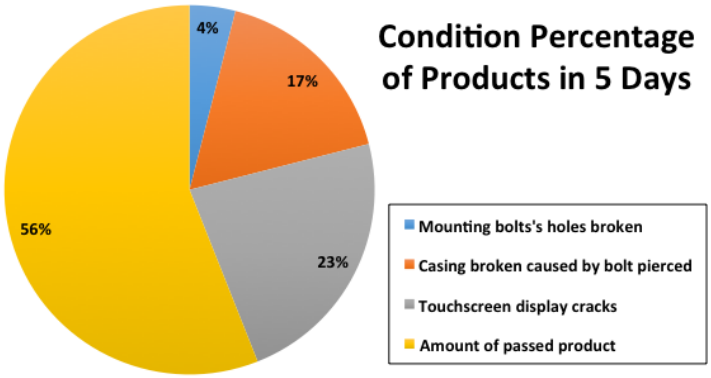


Figure I.3 Percentage condition of products in 5 days

Based on the three types of defect, the percentage condition of products in 5 days which occurs during E-KTP Reader final assembly process in 2016 is described in Figure I. 3, which shows that 44 % is defect. From these data, PT. ABC considered having problems because of the high percentage of defect.

Figure I.3 also shows that from 100 samples of E-KTP Reader product, there are 23% with type of defect touchscreen display cracks, 17% with type of defect casing broken caused by bolt pierced, and 4% with type of defect mounting bolts' holes broken. Based on the occurrence of defect, one of them is suspected caused by the lack of inspection activities at every stage of the assembly process. Ideally, to prevent possible causes of the defect type, strict inspections must be done so that the controlled process can be in accordance with the desired expectations. Before the test, the examiner must know and understand the criteria for the inspection of the item which being inspected. Inspection activities are designed to ensure that every process is already performing well, and no failures or defects could lead to other potential defects in the next process. To achieve the success of the final product with a minimal number of defects, the inspection must be done in detail and repeatedly. Irregular inspection and operator carelessness will cause damage gradually, and therefore the inspection activity at the stage-by-stage process is expected to minimize defects in the final product. It has been proven that routine scheduled inspections and preventive maintenance will guarantee the quality of products and processes. That is because if there is something undesirable happen, so the company could make the decision making whether it will be rejected or repaired, without having to disassemble the product at the final stage.

In fact, the current inspection activities conducted at PT. ABC only happens in the final stage of final assembly process from E-KTP Reader, which is after packaging process. However, on a stage-by-stage assembly process itself there are no inspection activities to ensure that every process has been done properly and to check that there are no errors or failures. Because of this, PT. ABC consumes more cost consist of cost of useless inspection and cost of saving for rework. The work done by the company in dealing with defect is a form of temporary solution

when companies perform rework when the products have been marketed to consumers gets complaints that resulted PT. ABC withdraw its products to be repaired. However, efforts to improve in the short term is not yet certain to be able to lower the percentage of defects in the next production of E-KTP Reader.

In this study, the authors will analyze more about the cause of the alleged occurrence of product defects that arise in the process the assembly and forms of prevention, as well as evaluate cost associate with inspection stage scenario.

I.2 Problems Identification

Based on the background that has been described, thing that will be discussed in this study are:

1. What factors are suspected to be the causes of defective products in the production process E-KTP Reader PT. ABC?
2. How to evaluate cost associate with inspection stage scenario?

I.3 Objectives

1. Identify the causes of defective products in the final assembly process of E-KTP Reader in PT. ABC.
2. Evaluate cost associate with inspection stage scenario.

I.4 Limitations

In an effort to achieve the objectives that have been put forward, it is necessary to give restrictions on the problem, namely:

1. This research will only implement the draft proposal of the stages in final assembly that have implemented inspection activities.
2. This study will only discuss the costs associate regarding losses due to product defects which occur using inspection stage scenario.

I.5 Benefits

The benefits of research to be obtained in this study, include:

1. It is expected that the number of products that pass inspection can be increased, to meet customer demand.
2. It is expected that the process of final assembly E-KTP Reader is running correctly from the beginning to the end of stage.
3. It is expected that the company is able to minimize the inspection cost

I.6 Writing Structures

Chapter I Introduction

This chapter contains the translation of the background issues that will be discussed in this study. This chapter contains the background, problem formulation, objectives, limitations, benefits, and writing systematic. These things serve as a foundation to create a proposed improvement in the final assembly process of E-KTP Reader in PT. LEN Industry. These also serve as a foundation to prevent and eliminate the causes of defective products at each stage of assembly.

Chapter II Literature Review

This chapter contains theories relating to the methods used. This chapter also contains theories used to explain the problem in this study. Theories, concepts, methods and tools of six sigma and other supporting theories that are used to support improved planning proposals will be explained in this chapter. The purpose of this chapter provides a scientific basis which is useful as a frame of mind in the research process.

Chapter III Research Methodology

This chapter contains explanations of the troubleshooting steps used in the study to achieve the research objectives to be achieved.

The research methodology includes conceptual models and systematic problem solving that will be used in this study expected to be in accordance with expectation value theory in order to calculate expectation cost associate.

Chapter IV Data Collecting and Processing

This chapter will show the reader about the collection of data to support the course of the study and data processing being performed to obtain answers to the problem formulation formulated in Chapter I.

Chapter V Analysis

This chapter will describe the reader on data processing results analysis obtained from previous chapter. On this chapters will also be an analysis of comparative initial conditions before given proposals and conditions that have rendered the proposed fixes. In addition to this chapter will discuss how the effects of the application of the proposal.

Chapter VI Conclusion and Suggestion

This chapter will describe the summary of the study and its results as well as the suggestions for future study.