ANALYSIS OF QUALITY CONTROL USING STATISTICAL QUALITY CONTROL METHOD (SQC) IN PT.X

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ABSTRACT
The purpose of this study is to measure the variation of product returns, identify the factors that cause damage to the product by using the statistical qoality control method. statistical quality control is a control process used to collect, analyze, and interpret data used in quality control activities. The tools used in processing data are stratification, pareto diagrams, control charts p, diagram cause and effect. The high product that is returned by consumers can result in losses. Damage to the y product is classified into three types, namely types of spots, rot, bruises. The three types of damage resulted in the product being returned by consumers. The problem must be solved immediately and a solution is sought to handle it. After identifying the types of returns by consumers, then on the Pareto diagram calculating the percentage cost of damage, then the results of the most dominant damage costs due to returns are 66 product variances from 7 types of product, followed by the control chart p. products that are still outside the control limit. The method used in analyzing is a diagram cause and effect.

Keywords: Statistical Quality Control, Pareto Diagram, Control Chart p.

1. Introduction

Quality is one of the most important decision-making factors of consumers because it needs to be controlled. The purpose of quality control is to ensure that processing is carried out in an acceptable manner [1] [2]. Quality control is a system that maintains the desired level of quality, through feedback on product characteristics and provides corrective action if there are deviations in characteristics from the specified standard [3]. Statistical Quality Control is a control process used to collect, analyze, and interpret data used in quality control activities [4] [5]. With statistical process control with the aim of detecting and diagnosing situations where a process has come out of statistical control. Operationally, the state of statistical control can be described as a situation where the reading process appears to follow a general statistical model. One model is when the process is in statistical control [6]. Statistical quality control has seven tools used to control quality [3] including check sheets, stratification, histograms, pareto diagrams, causal diagrams, scattered variances, diagram control. These tools stabilize the production process and improve product quality [7].

2. Literature Review

2.1 Quality Control

Quality management is related to concepts, procedural techniques and manufacturer's attitude towards maintaining the quality of the products produced. Quality is defined as the desired characteristic / characteristic. Management or control is defined as safeguards that include planning, measuring and adjusting the planned quality. In the quality industry or desired traits are best for the benefit of the user, keeping in mind the actual usability and the price that must be paid by the user. Some matters concerning management / quality control are:

1. Determination of quality standards

2. Examination of implementation
3. Actions against deviations from the standard set
4. Plan for standard improvements

Quality control methods are:
1.Make use of statistical theories and mechanical technology experience, so that reliable data can be obtained and give a fairly early / sharp signal about the existence of symptoms of irregularities.
2.Using a sampling method to provide reliable quality assurance for product quality with minimal costs [5].

2.2 Statistical Quality Cotrol

The Statistical Quality Control Method (SQC) is not primarily directed at finding bad product reasons and calculating the number of bad products but eliminating the cause by detecting the problem before poor production. The presence of deficiencies and damaged goods increases operational costs (such as repair, rework, waste, replacement, warranty and detailed inspection costs) which have expensive manufacturing problems [8].

Quality products can not be separated from the concepts and techniques used in product quality improvement, one of them is by using quality control. Statistical quality control is a technique used to, control, analyze, manage and improve products and processes by using statistical methods to ensure and improve product quality [5] [4]

Statistical quality control has seven main statistical tools that will be used as a tool to control quality [3], to solve the problems used in this study only 4, namely:
1.Stratification is a process of defect data grouping that occurs on the production floor. [9] [4].

2.Pareto diagram is a diagram that compares the causes of problems with their frequency. Based on the Pareto principle, 80% are problems of 20% factors, in other words, although there may be many factors for the problem, some are important and most problems can be solved by removing them. By using the Pareto diagram, various causes of inappropriate effects can be categorized and can be displayed quickly which categories are clearly more important [7].

3.A control charts is a tool that is graphically used to monitor an activity that can be accepted as a controlled process. Controlling maps are also often called She whart control charts because in this map it was first made by Walter A. Shewhart. The control chart that is most often used is the control chart p, used to control proportions with items that do not meet (rejected) in the specified specification requirements (which are categorized as damaged). The part that is rejected p, can be defined as the ratio of most items that are not suitable in the inspection process or inspection line to the total product that is not suitable in the inspection process [9] [5] Control maps provide moving range information drawn for data about quality characteristics to see whether the process is controlled [1].

4.In the diagram cause and effect or often called Ishikawa in accordance with the name of Prof. Koaru Ishikawa who came from Japan by analyzing the diagram. The causal diagram is a structured approach that can enable an analysis to be carried out in more detail that discovers the causes of a problem, discrepancies, and existing gaps [9] [3].

3. Method

The data used in the study were the number of shipments, the number of returns, the number of returns returned, the amount was destroyed in October 2017 until August 2018. The method used was statistical quality control. The tool used in statistical quality control is stratification to identify problems into groups or similar groups which are the sole element of the problem [8] [4], Pareto diagram is to identify the main problem in increasing quality from the largest to the smallest [8], map control p provides moving range information drawn for data about quality characteristics to see whether the process is controlled [1] [9], the result diagram shows the relationship between problems encountered with possible causes and influencing factors [3].

4.Results and Discussion

a.Discussion of the use of SQC

In statistical quality control, the statistical tools used in the study are:

i.Stratification

Stratification of consumer returns that are useful for identifying products returned by consumers. In this stage the researcher defines the types of customer returns. The types of consumer returns are rotten products, bruises, spots.

ii.Pareto diagram

Based on the pareto diagram, it can be seen that 80% of the cost of damage due to returns is dominated by 66 product variances y of 7 types of products, namely products y_1 with a percentage of 6.8%, then products y_2 with a percentage of 4.2%. product y_3 with a percentage of 3.8%, product y_4 with percentage, product y_5 with a percentage of 1.2%, product y_6 with a percentage of 1.1%, product y_7 of 0.7%. So repairs are done by focusing on 7 types of products.

iii.Full Map p

Based on the results of data processing and control p maps it has been obtained the results of the variation of product returns on the control chart p of 66 product variances there are 2 product variances y which are still outside the control limit ie products y_2 are still outside the control limit is still experiencing irregularities, namely in August, the product y_8 still exists outside the control limit still experiencing irregularities, namely in November and August.

iv.Digram cause and effect

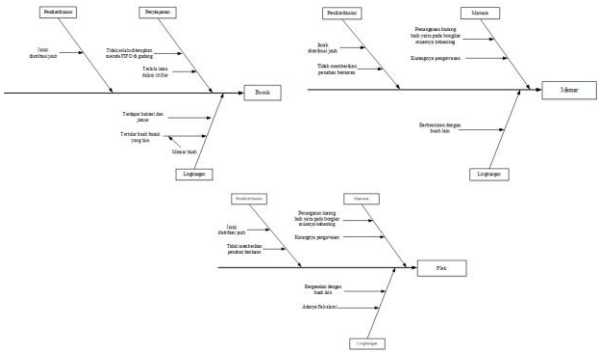

Figure 1 Digram cause and effect

v. Repair 5W1H

5. Conclusion

Based on the results of data processing, conclusions are drawn:

1. The variation of product return rate on the control chart p of 66 variances product there are 2 variances product which still exist outside the control limit, namely:
   a. In the product y_2 there are still those outside the control limit that still experience irregularities, namely in August.
   b. In products y_2 there are still those outside the control limit that still experience irregularities, namely in November and August.
2. The causes of damage to the overall product due to poor handling, namely the loading and unloading of products that are not carried out properly and lack of supervision, failure, collision and friction that cause good quality products to be damaged, FIFO systems are not always implemented , distant distribution distance and does not provide impact resistance.

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