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ANALYSIS OF QUALITY CONTROL E HOUSING PRODUCTION IN XYZ COMPANY

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ABSTRACT

This study will analyze the quality control of the XYZ Company in
order to produce E-house in the Bending Production Line. There is still
a defect in this Production Line in the form of a mismatch in the
curvature of the E-house product. For the research method used is
Statistical Process Control (SPC) then the results will be analyzed by
Cause and Effect Analysis method. Many disabilities occur in September 2017 as Defect
Proportion is greater than UCL. The defect was caused by the operator's weariness due to
work, decreased bending machine capability and noisy production environment.

KEYWORDS: *Statistical Process Control method, eliminating defect.*

1. INTRODUCTION

In the face of increasingly fierce business competition, companies are required to always
produce products that have good quality and meet customer satisfaction so as to generate
profits for the company. So from that product quality is used as a reference by the company
in meeting customer satisfaction. But the fact is that the production process is still found to be
flawed, resulting in a loss for the company. Quality is a dynamic condition that relates to
products, services, people, processes, and environments that meet or exceed what is expected
(Goetch, Davis,1995).

One effort to reduce the number of defects by quality control is to produce standardized
products and meet consumer expectations in the context of competitive competition, so the
company can "sustain". In fact, the production process that has been guarded with quality is

very tight, there are still many production errors, so as to produce products that are not in line with the company's expectations.

The xyz company is one of the companies that produce E-House whose production process has 3 production lines, namely Bending Production Line, Welding Production Line and Painting Production Line. In the production process, the company still found production defects at the Bending work station where there were discrepancies in the curvature of the E-house products, at the Welding work station there were some welding parts that were not and at the Painting work station which were some parts of the E-House which were not thorough paint.

This study will analyze the production process on the Bending production line and from that problem the xyz company requires quality control to minimize defects in order to achieve the quality tart determined by the company and analyze the factors that influence the E-House production process in the production line in the future the product produced by the xyz company can meet the expectations of its customers. The tool we used to examine quality control using statistical tools, namely Statistical Process Control (SPC) and will describe the causes and improvements using the Fish Bone Diagram.

2. LITERATURE REVIEW

2.1 Quality

According to Juran (1993: 32), quality is fitness for use to meet customer needs and satisfaction. Fitness for use according to Juran is obtained from 5 characteristics including:

a. Technology is strength or endurance.

b. Psychology is the image of taste or status.

c. Time, that is reliability.

d. Contractual, which is a guarantee.

e. Ethics, namely polite, friendly and honest.

So quality management can be interpreted as various activities in planning and organizing products regarding process quality, product reliability, and quality assurance and quality control by each management function. In order for quality to be improved, quality management must involve all organizational functions and all levels of management.

2.2 Statistical Process Control (SPC)

We use statistics to make decisions in a process or community based on information available in a sample from that community. In the matter of the quality of the static method, taking a product sample then testing and evaluating it produces statistical data which will be used to evaluate and control product quality. Statistical Process Control is a process used to monitor standards, making measurements and taking corrective action as a product or service is being produced (Heizer and Render, 2006: 268). In the production processes there are quality standards that have been set, therefore it must always be controlled and monitored to maintain product quality.

In Statistical Process Control (SPC), there are 2 types of data (Gaspersz, 1998: 43) including:

1. Data attribute

Attribute data (Attributes Data) is a discrete qualitative data, Attribute Data (Attributes Data), namely qualitative data that can be calculated for recording and analysis. That is, the observed data for the quality process cannot be measured by value but can be observed in characteristics.

2. Variable data

Variable data (Data Variables) are quantitative data that are measured using certain measurement tools for the purposes of recording and analysis.

2.3. Data adequacy testing

To ensure that the data collected has been objective enough. The data adequacy test is used as follows:

$$N' = \left[\frac{k/s \sqrt{N \sum X^2 - (\sum X)^2}}{\sum X} \right]^2$$

By:

k = confidence level

k = 95% = 2

s = Degree of accuracy 5%

N = Amount of observation data

N '= Amount of theoretical data

If N $\leq$ $\leq$ N, then the data is considered sufficient, if N '> N the data is considered insufficient (less) and needs to be added to the data.

3. METHODOLOGY

The analysis model in this study is in the form of a control chart and analysis of the causal factors to illustrate how quality control has been done by PT. XYZ in analyzing the level of product defects so as to produce recommendations for improving the quality of production going forward. Based on the theoretical basis, this study has a research step as presented below:
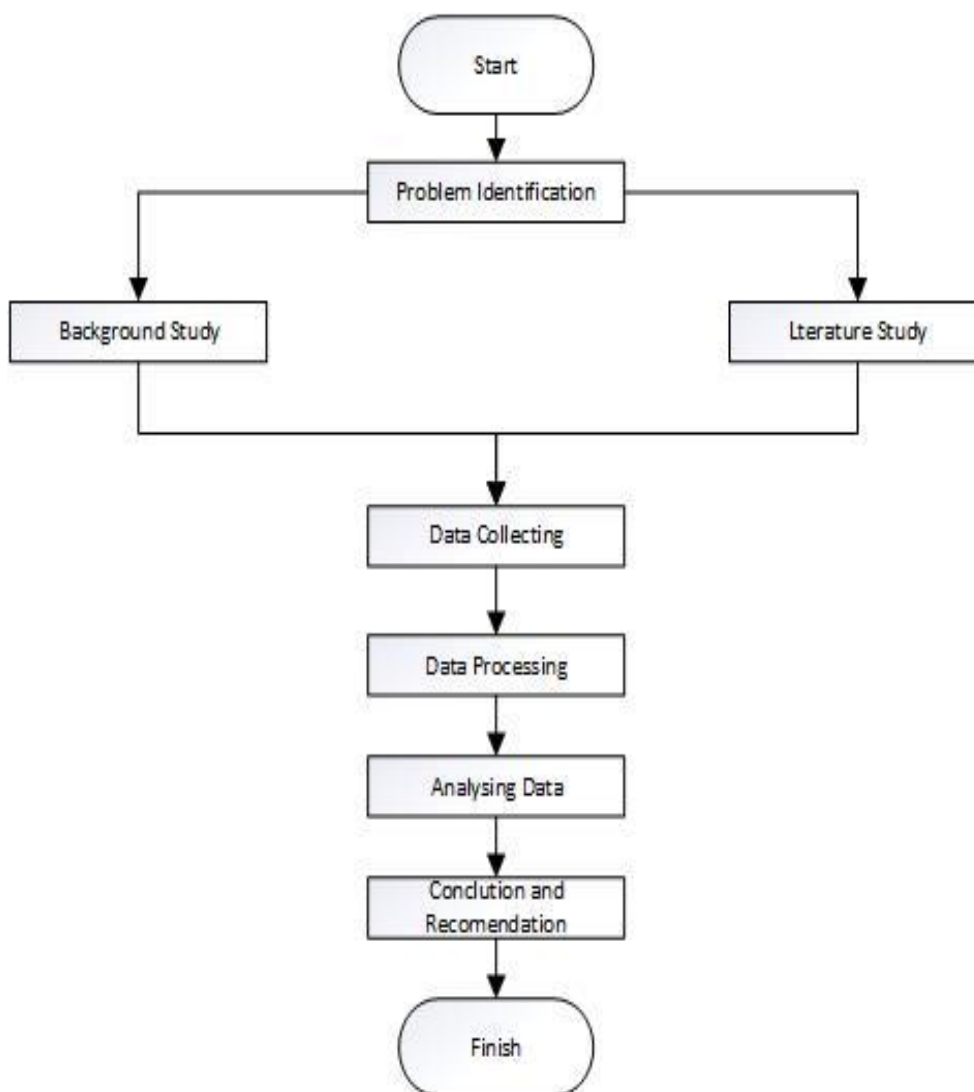
4. SAMPLE

4.1 Data Collection

In the e-house production process, the first production line is the bending stage which still has defects. The following is the production of e-houses by the XYZ Company and taken from the Quality Control division.

Table-1.

Month	Bending		
	Output	**Defect**	**Defect Proportion**
April 2014	369	13	0,035230352
May 2014	433	19	0,043879908
June 2014	455	17	0,037362637
July 2014	445	18	0,040449438
August 2014	605	20	0,033057851
September 2014	320	25	0,078125
October 2014	290	15	0,051724138

The next stage, the researcher will test the data on the adequacy of the data that has been provided by the xyz company. Testing the adequacy of data based on statistics, namely the degree of accuracy and the level of confidence / trust. The degree of accuracy and level of confidence / trust is to reflect the level of certainty desired by the gauge after deciding not to take measurements in large numbers (population).

Table-2.

Month	Amount of Production (x)	X^2
Apr-14	369	136161
May 2014	433	187489
June 2014	455	207025
July 2014	445	198025
August 2014	605	366025
Sep-14	320	102400
October 2014	290	84100

From conducting the Data Adequacy Test, N '= 4.4 is obtained, so the data is declared sufficient because N' <N (N = 7).

4.2. Data processing

The results of processing data processed from Table 1 by the SPC method and the results are described in full by the table below so that it is easy to analyze the problem.

Table-3.

Month	Bending		Defect Proportion	Standart deviasi	UCL	LCL
	Output	Defect				
Apr-17	369	13	0,035230352	0,010623175	0,075064526	0,011325474
May 2017	433	19	0,043879908	0,009806716	0,072615147	0,009317853
June 2017	455	17	0,037362637	0,009566693	0,071895079	0,010037921
July 2017	445	18	0,040449438	0,009673587	0,07221576	0,00971724
August 2017	605	20	0,033057851	0,008296403	0,068084209	0,013848791
Sep-17	320	25	0,078125	0,011407554	0,077417663	0,004515337
October 2017	290	15	0,051724138	0,011983082	0,079144246	0,002788754

Based on the table above, it can be seen based on the number that the UCL value is greater than the deficit proportion means that the product process in September 2017 has a lot of disability so it can be said that the production process is out of control.

4.3 Identification of the causes of production defects
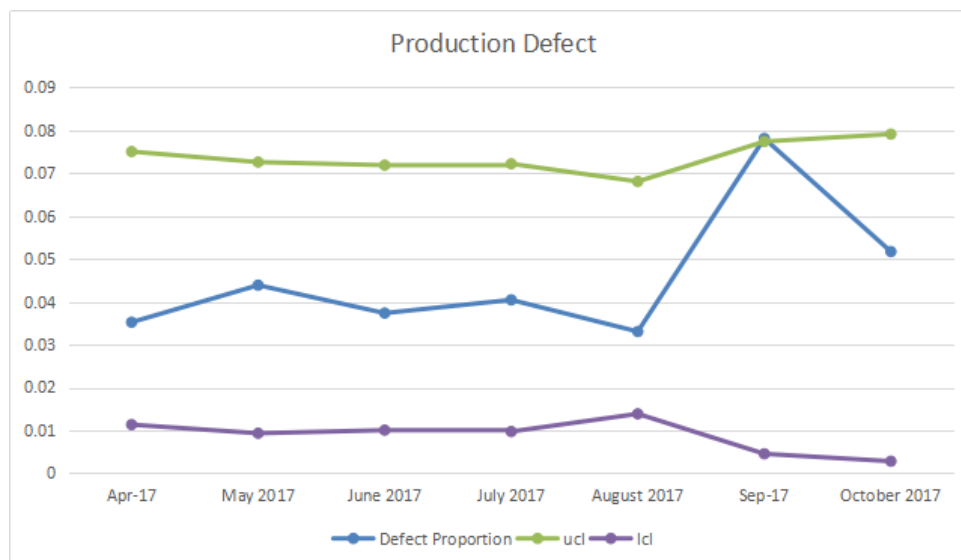
Based on the graph of the P control chart above, it was found that the production process at line Bending has gone well but in September 2017 it was above UCL which means it can be interpreted as an imperfect and uncontrolled production process. So there can be a deviation in the E-House Bending Production Line.

Therefore, the next step in this study examines the causes of e-house production defects so that it can be a recommendation to xyz companies to reduce the level of defects in the Bending Production Line. The search method for the causes of e-house defects in this study used the Cause and Effect Analysis Method, and the results will be known the relationship between the problems in the Bending Production Line and the causal factors.

The results of the Cause and Effect Analysis Method can be seen below:

a. Man (human), Tired of the Operator so that the Operator misplaced the material for printing and products that failed partially removed

b. Machine (machine), Bending ability of the machine decreases so that there is often rework and adjustment to pressure.

c. Material (Material), Hard Material Profile so it is difficult to form.

d. Environment (environment), noisy production environment so that the operator is difficult to concentrate, which results in the production of the angle is not in accordance with the provisions. Then the layout of the tool is not neat so that it interferes with the production process.

5. CONCLUSION

From the results of this study it can be concluded that XYZ Company needs to make improvements to the production process and carry out quality control. Many disabilities occur in September 2017 as Defect Proportion is greater than UCL. The defect was caused by the operator's weariness due to work, decreased bending machine capability and noisy production environment. Therefore, the XYZ Company needs to make corrections to reduce product defects and their causes.

REFERENCES

1. Chin, S., K. Kim, & Kim, Y.-S. *A process-based quality management information system, Automation in Construction*, 2004; 13: 241–259.

2. Dale, B.G., H.S., Bunney, & Shaw, P. Quality management tools and techniques: an overview. In Dale, B. G. (ed): *Managing Quality* (4th Edition). Blackwell, Oxford, 2003.

3. Layzell, Jeremy & Ledbetter., Stephen, FMEA Applied to Cladding Systems – Reducing The Risk of Failure, 1998; 26: 351-357.

4. Omdahl, T.P., Reliability Availability and Maintainability Dictionary, ASQC Quality Press, Milwaukee, 1983.

5. Thorpe, C.D., W.D. Torrence, & Schniederjans, M., Quality assurance in human resource management for Computer-Integrated Manufacturing. *International Journal of Quality & Reliability Management*, 1994; 14(2): 18-30.