

IMPROVEMENT OF WASTE REDUCTION IN THE JEANS BLEACHING PRODUCTION PROCESS IN THE ABC FACTORY

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ABSTRACT

This research aims to 1) Study the causes of waste in the jeans bleaching process and 2) Reduce waste in the jeans bleaching department. The sample was thirty factory employees in this research. 7 quality control tools (7QC Tools) were used for all and using a fishbone diagram. Bar chart was used to sort the cause of the problem and using the seven waste theories and ECRS to reduce waste.

The research results showed that the cause of waste in the production process was the capability of the newly reloaded employee's lacking of work experience. For the solution to the problem is proposed by collecting waste data from the pattern of jeans bleaching process without the pattern as in the sample. The data was collected for 7 days before the improvement. It was found that there were 2,201 pieces of defective jeans pattern, was to 0.70 percent of all. for the new employee in jeans bleaching department in order to reduce waste from jeans patterns with no sample was more efficient, data were collected after 7 days of improvement, result in 1,718 pieces was to 0.53 percent of all. The amount of waste in the production reduce was 483 pieces/week.

Keywords: 7QC Tools, process improvement, 7 Wastes of Lean, ECRS

INTRODUCTION

Nowadays, most of the production of clothing and textiles is made using machines. To focus on productivities improvement goals, such as shortening production times, reduced costs, increasing profitability for business and improving quality with a focus on eliminating waste. in activities related to production In production can be divided into two types: Value-Added Activities (VA) is refer to any activity that causes changes in the shape of raw materials. or information that makes customers satisfied and non-value added activities (NVA) are activities that use resources but do not create customer satisfaction these activities It is estimated that 95% of the time while a product is in the factory is spent on non-value-adding activities, and only 5% of the time is on value-adding activities. Therefore, it is time management and work to reduce losses. The main principle is eliminating everything that causes loss (Komanasin, 2007)

Because the ABC factory has a large number of jobs that customers send to wash, dry, iron, which causes employees to speed up the work process to deliver to customers, causing

employees to make mistakes, resulting in waste from speeding up work from production, for example, putting a lot of clothes into the washing machine one at a time until the washing machine is tight, causing the clothes to pull apart, including washing the clothes that are not colored according to the customer's needs to dry clothes using higher heat to dry clothes quickly, therefore, it is found that there is a huge loss of dry clothes. cannot be returned to the customer, resulting in waste and cannot be sold. Therefore, reducing losses is very important in the production process management operation (Niyomrat, 2018).

As mentioned above, this researcher is interested in study the waste reduction method of the ABC jeans bleaching factory as a tool for increasing profitability for business and in developing its business-level production process and product improving quality create customer satisfaction.

Research objectives

1. To study the causes of loss problems in the jeans bleaching process.
2. To reduce waste in the work process of the jeans bleaching department.

LITERATURE REVIEWS

1. 7 QC tools

The 7 QC tools for process Improvement are systematic and scientific methods for problem solving and they are used product and process improvement. It's including 1) Check sheet, 2) Pareto Diagrams, 3) Cause and Effect Diagrams, 4) Scatter Diagrams, 5) Graphs, 6) Scatter Diagrams, and 7) Control Chart. (Manomat et al., 2012)

2. Process Improvement

Process improvement is a methodology within project management, specifically in manufacturing, that helps you take in and evaluate feedback about your processes to ensure continual improvement. Its aim is to always be improving the efficiency and effectiveness of your business strategy, customer or manufacturing processes. This research used production process of jeans bleaching and used Cause and Effect Diagram provides tools to help identify potential issues.

3. 7 Wastes of Lean

The lean method of production is a philosophy developed by the Toyota Production System. It focuses on eliminating inefficiency while delivering the highest level of value to the customer. Lean manufacturing is a manufacturing philosophy that is based on the distinction of the concept of production from the flow of production from raw materials to products and from product design to customer service, with the aim of eliminating waste and producing products to meet the needs of customers. (Allen et al., 2001)

The 7 wastes, known as 'Muda', are the various forms of inefficiency that the lean production systems seek to eliminate. Waste, by definition, is something that adds no value. By removing these forms of inefficiency, company can boost manufacturing plant's productivity and return-on-investment. its including 1) Overproduction, 2) Zero inventory, 3)

Defects lead to a huge waste of time, 4) Motion wastage, 5) Over-processing, 6) Waiting, 7) Transportation

4. ECRS

Its lean technique for improvement product, Acronym for ECRS.

Eliminate – Identify the steps and details of work that can be quickly eliminated

Combine – When work cannot be eliminated, then seek to combine steps together

Rearrange – Work can also be rearranged in a different order or sequence that can be faster, easier or safer

Simplify – Make the process work easier to complete through the use of visuals, aids, fixtures and templates.

METHOD

Waste refers to what is lost in the production process without causing any benefit, which results in a decrease in work efficiency. The techniques used to waste reduce, including 7QC Tools, process improvement, 7 Wastes of Lean, ECRS, etc. There are 5 steps in the research process as follows.

1. Collect waste production information and waste characteristics before improvement.
2. Analyze the cause of the problem using a fishbone diagram (Cause and Effect Diagram)
3. The implementation of improvement of waste reduction using 7 Wastes of Lean and ECRS.
4. Collection data waste production after improvement
5. Analyze research results, discussion and recommendations.

RESULTS

1) Results of collecting data on waste characteristics and waste conditions before improvement

To reduce the waste of jeans bleaching process need collect waste production data. The researcher has designed Interview form and waste characterization. The researcher has designed a check sheet to collect waste data from the records of jeans waste in the jeans bleaching process. Data collection from December 2021-February 2022 by collecting data on waste characteristics by brainstorming from ABC factory employees, jeans bleaching department and the amount of waste before improvement. The data was collected by studying the problem conditions that occurred at the production process that had the most waste and the cause of the loss. The number of waste production caused by waste characteristics that the researcher collected waste for a week was shown as follows.

- a. 1,529 pieces of faded jeans
- b. 1,277 trouser leg torn ends
- c. 2,201 wrong designs of jeans
- d. 535 shrinking jeans waist

2) The results of the analysis to determine the cause of the problem

Sort all waste production characteristics. Using a bar chart to rank them To visualize the waste production as clearly as possible and see the amount of waste as high as possible. For easy analysis to search the cause of waste.

Results from the use of quality tools by using a bar chart to sort the waste production characteristics of the most to the least defective to help in selecting and solving the loss problem by the nature of the waste, the most problematic is that the jeans pattern does not follow the sample.

Use a cause and effect diagram or a fishbone diagram (Cause and Effect Diagram) from the quality problems that occur. waste production derived from the bar chart. To find the cause of the problem in all aspects, namely employees (man), machines (machine), raw materials (material), work methods (method), in which each of the main causes It will be separated into sub-causes, which will cause the cause of the problem. The researcher will choose the cause that the researcher can fix initially. To reduce waste as shown in Figure 1

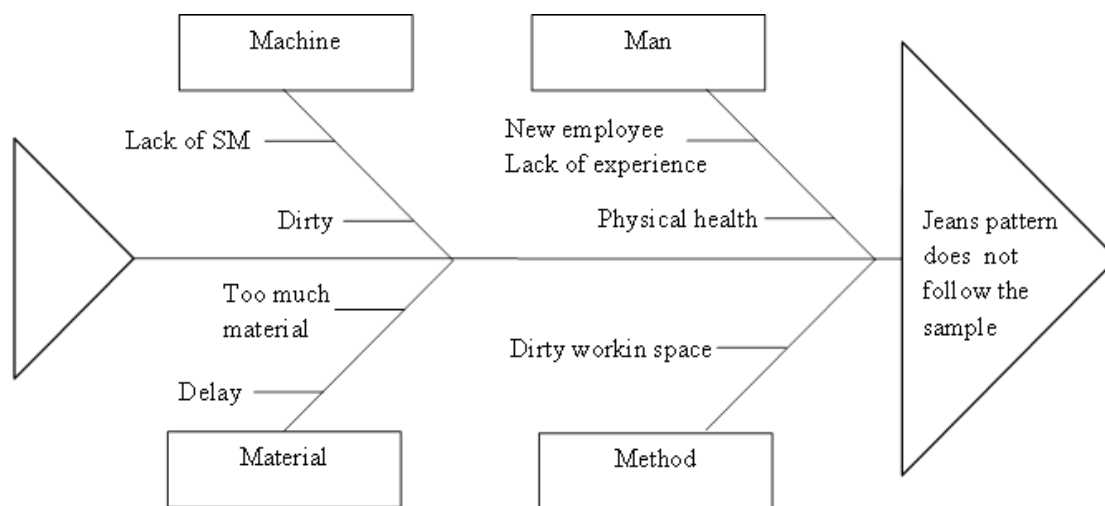


Figure 1 cause and effect diagram of waste in jeans

3) Analysis of waste reduction improvement actions

The researcher has started working on improvements. by conducting a survey of operational procedures in the process of bleaching jeans After collecting the problem data from working in the production process to study the nature of the problem, that is, the pattern of the pants does not match the sample. And the main reason that the researcher was able to preliminarily solve the problem was new employees with little experience. Cause waste the researcher therefore proposes solutions for improvement by using the 7 loss theories and the elimination of losses. The topic of loss due to waste production is solved by 1) Establishing standards of operation and standardization of correct raw materials. 2) Develop working methods in order to prevent the recurrence of waste as in table 1

Table 1 showing causes of problems and ways to improve

the cause of the problem	improvement solution
New employees, lack work experience.	According to the survey, the jeans bleaching department at ABC factory has 3 new employees, who in 1 person have to wash 400 jeans in 8 hours, it takes 120 minutes or 2 hours per cycle to wash. One round used jeans 140-150, so the researcher proposed a solution to arrange a mentor to teach and consult to new employees for reduce shyness to work to employees and reducing the production number of jeans per cycle to 80 per cycle, and interview experts, If the production number of pants per cycle can be reduced, there will be less mistakes. and increase working time It is an additional 2 hours of OT to increase the resolution of the work more.

4) Result of data collection after improvement

Improvement effect after proposed improvement to the new employees of the jeans bleaching department. In order to reduce waste from uneven jeans patterns to be more efficient from collecting data after 7 days of adjustment as shown in table 2.

Table 2 shows the number of defects caused by the jeans bleaching pattern not being in accordance with the design after improvement.

Date	Number of production/pieces	The amount of waste from the jeans pattern is not according to the design (pieces)	waste percentage
1	3,000	380	0.12
2	3,000	289	0.09
3	3,000	253	0.08
4	3,000	256	0.08
5	3,000	258	0.08
6	3,000	148	0.04
7	3,000	134	0.04
total	21,000	1,718	0.53

From finding the cause of the problem and finding a solution to the problem by applying the theory of reducing the loss of 7 factors due to excessive waste production. To be used to solve the problem of defects caused by new employees. less experienced By using a standardization method to return new employees and develop work methods In order to prevent recurring waste, it can be concluded that the waste caused by the pattern that does not follow the pattern can be reduced according to the planned objectives.

CONCLUSION AND FUTURE WORK

From the study of the loss of jeans bleaching in the bleaching department of the ABC factory, it was found that the cause of the loss in the jeans bleaching process was caused by new employees. little experience And proposed to improve the work process to reduce the amount of waste in the jeans washing department work process by using 7 wastes to reduce waste by collecting data of problems from working in the production process to study the characteristics of the work site. The problem that arises is that the trouser pattern doesn't follow the sample. And the main reason that the researcher was able to preliminarily solve the problem was new employees with little experience. that cause waste production

The researcher then proposed the following improvement methods: 1 employee had to 400 the jeans bleaching process in cycle, spending 120 minutes or 2 hours/cycle in one cycle, using 140-150 jeans to wash. The research therefore proposes a solution to having a mentor to teach the job and to give advice to new employees to reduce the shyness of returning employees and reducing the number of jeans/cycle to 80 pieces/cycle. The waste that occurs before the improvement from the 7-day data collection averages 2,201 pieces, representing 0.70% and the number of waste that occurs after the improvement from the 7-day data collection. day, an average of 1,718 pieces, equivalent to 0.53% of the amount of waste is 483 pieces/week. This is consistent with the research of Junsri (2021) who has studied the subject “Defective reduction of aluminum base casting part for hard disk drive manufacturing: A case study of a hard disk drive manufacturing factory” The analytic results of this research indicated that the total defective parts before the improvement between January and October, 2018 amounted to an average of 2,930 pieces per month. There were 2 important types of the defects: foreign materials and ED chips stuck on the workpieces. The amounts of defects caused by the two causes were 9,833 pieces or 33.6%, and 8,939 pieces or 30.5%, respectively for the total of 64.1%. After utilizing problem analysis techniques, steel baskets were used to replace the existing plastic ones. This prevented plastic material from sticking on the workpieces. Also drilling tools used to drill the workpieces were changed to chip break to prevent the longer chips from getting stuck on the workpieces. The results indicated that the defects were reduced to 500 pieces per month, or 82.9% reduction. It is also in line with the research of Niyomrat et al., (2021) who has studied the subject “Process Improvement of White Coconut Meat Production in Samut Songkhram Province”. The results showed that the white coconut production process had a problem with the coconut fiber extractor machine stopped working. There was 1 non-value added activity and 10 necessary non value added activities. To improve the production process by (1) Make a working standard for loading into the coconut fiber extractor machine. (2) Include activities of preparation for internal transport, which are necessary non value added activities; to be the same activity as the main activity. (3) Change the main workload and adjust the number of employees according to the changing process; and (4) Cut off non-value added activities and activities that are not directly related to quality control of production processes and products obtained. The results of the implementation of the process improvement plan were found that: After the improvement of the white coconut production process in Samut Songkhram Province had a reduction of 12 activities, the total

movement distance decreased by 2.6 meters, and the time spent throughout the process decreased by 17.11 minutes.

RECOMMENDATION

From research studies to improve the results and find solutions that cause waste in the ABC factory organization with the following research recommendations.

1. The results of research finding the cause of the waste of the ABC factory found that there was a cause due to new employees have less work experience, resulting in work that does not meet the goals. And the amount of work that the factory determined caused waste from the operation of new employees who lack knowledge and ability to work in the production process.

2. According to the results of research finding the cause of the waste of the factory. ABC, the researcher therefore would like to propose a guideline to promote and solve problems caused by the occurrence of waste by make suggestions for ways to reduce waste by training new employees before starting work. Work trials to measure the performance of employees before working in the production process with a mentor to give advice. and guides the correct operating procedures to minimize waste.

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