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Analysis Of non Value Added Activity on Toner Cartridge Printer Ink Refill at CV SCMG

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ABSTRACT

CV SCMG is a company engaged in various computer services. The problem faced is the service of refilling the printer toner cartridge ink was non value-added activity. Empty toner cartridges was wasting time. With this condition, the process of refilling the printer's Toner Cartridge ink became a little disturbed so that it becomes less than optimal. From the existing problems, time analysis efforts can be carried out further by using a causal analysis, 5W + 1H analysis of the constraints in the process of refilling the printer ink Toner Cartridge less than optimal time. The results of the calculation with the initial conditions obtained the results of 5.86 minutes and after repairing it to 5.11 minutes so that work productivity is expected to be better.
Keywords: Cartridge, Non Value Added Activity, Waste

1. Introduction

CV SCMG is a company engaged in the services of various types of computer services. This business is only assisted by two people, namely one owner and the other is the technician and courier. This business serves the filling of Ink Toner Cartridges. There was problem in the process before filling the Toner Cartridges searching for empty Toner Cartridges that were still stored in the box. This problem has an impact on wasting time.

Therefore this activity do not provide added value. On average this activity took for 1 hour. In August 2020 there were 5 cases. In September 2020 there were 7 cases, in October 2020 there were 8 cases. So the case was increasing.

This non value added activity has an impact on the delay in refilling the Toner Cartridge printer ink. The re-filling target was 10 units per day but due to the delay and it became only 8 units per day, the remaining 2 the unit is carried out the next day. This leads to time wasting.

Table 1 : Problems

Problems	Frequency	%	Cumulative Percentage
Looking for an empty Toner Cartridge still stored in the box	20	71,4%	71,4%
Received goods are damaged	5	17,8%	89,2%
Lack of Technicians	3	10,7%	100%
Total	28		

From the data in table 1, it can be seen that there are problems in the work area, an empty Toner Cartridges were still stored in their boxes 20 times, received goods are damaged 5 times, 3 times for the lack of technicians.
The purpose of this study is to analyze the time of activities that do not have added-value to the process of refilling printer ink toner cartridges.

2. Material and Methods

Method used in this study are included standard time calculations, cause-and-effect analysis and (5W1H) analysis and time analysis consists of Cycle Time, Normal Time, Standard Time, Adjustment & Allowance.

Based on Tiara and Perdana published on 2019 NVAA is an activity that does not add value to consumers, but activities are needed in the production process.

2.1 Cycle Time

Cycle time is the time between the completion of two consecutive meetings, assumed constant for all meetings. It can be said that the cycle time is the result of direct observations recorded using stopwatch.

The time required to carry out work elements in general is slightly different from cycle time. Even if the operator works at a normal and uniform speed, each element in different cycles will not always be adjusted in exactly the same time. This difference in time value can be caused by several things. One of them can occur because of differences in setting the start or end time of a work element that should be read from the stopwatch.

2.2 Normal Time

Normal time is working time that has taken into account the adjustment factor, namely the average cycle time multiplied by the adjustment factor.

In the practice of measuring work, the method of applying the operator's work performance rating is based on a single factor, namely operator speed, space or tempo. This system is known as "Performance Rating/Speed Rating)". This factor rating is generally expressed as a percentage (%) or decimal number, where normal work performance will be equal to 100% or 1.00.

2.3 Standard Time

Standard time is the actual time used by the operator to produce one unit of product type data. Standard times for each part shall be stated including tolerances for resting to overcome fatigue or for unavoidable factors. However, the period of use of the standard time has a limit.

2.4 Waste of Time

Time wastage are the types of waste that occur in the manufacturing process or services, namely transportation, inventory, movement, waiting, excessive processes, excessive production and damaged goods abbreviated TIMWOOD (Transportation, Inventory, Motion, Waiting, Over-processing, Over-production, Defect)

3. Results and Discussions

The results obtained from the observation time data for the steps to refill the toner cartridge, are as follows :

- Looking for empty toner cartridge is still stored in the box, the time is (2070 minutes)
- Opening of Case side (105 minutes)
- Splitting of Case into 2 (Reservoir Case & Disposal Case) (77 minutes)
- Opening of Magnet Roll (133 minutes)
- Opening of Doctor Blade (131 minutes)
- Opening of Drum Unit (128 Minutes)
- PCR open discharge (110 minutes)
- Disposal of used toner powder (121 minutes)
- Cleaning of the Case Collector (154 minutes)
- Pouring of the toner powder into the holder (128 minutes).
- Assembling all the components (248 minutes)

The total observation time for 3 months was 1640 minutes and the average observation time for 3 months is 149.10 minutes.

To determine the standard time to refill toner the calculations are as follows :

Average cycle time (CT)
Calculation of the average cycle time is the time obtained during the observation using a stopwatch for 18 observation time.

CT = 15,48 minutes

Normal Time
Normal time is using equation as follow :

Normal time = Average cycle time * adjustment factor
Normal time = 15,48 minutes * 1,14 = 16,62 minutes.

Standard Time
Calculation of the standard time is using as follow :

$$Standard\ Time = Normal\ Time\ X \frac{100\ \%}{100\% - \%Allowence}$$

$$Standard\ Time = 16{,}62\ X \frac{100\ \%}{100\% - 34\%} = 10{,}97\ minutes$$

Cause - Effect Analysis
After selecting the time wasting problem to be a priority problem to be solved at CV. SCMG, a cause-and-effect diagram will be used to analyze the root cause of the waste of time. The following is a cause-and-effect analysis of time wastage:

a. Human
Lack of concern for the empty toner cartridge stock resulted in the technician having to look for it first before starting the work of filling the toner cartridge which resulted in the technician's work being hampered.

b. Method
From the method used, the company has not made a schedule for storing empty Toner Cartridges in a special shelf.

c. Environment
From an environmental point of view, there is not enough room in the store to store an empty Toner Cartridge.

From the analysis using the fishbone diagram above, it can be seen that from the human factor, lack of thoroughness results in rushing work so that the work becomes less effective, and from the method of lack of technicians resulting in the participation of the supervisor stepping in to refill the printer ink Toner Cartridge to replace the technician is lacking. From environmental factors in the store CV. SCMG lacks space to store empty Toner Cartridges

5W+1H Analysis
Basically 5W1H in a manufacturing is a method used to conduct investigations and research on problems that occur in the production process. 5W1H is an abbreviation of 5W which is What,(What) Where,(Where) When, (When) Why,(Why) Who (Where) and 1H which is How (How). This 5W1H concept or method of course can not only be used in the production process. Currently researches, criminal investigations or journalism also use the 5W1H method to collect information and analyze problems that occur so that we can take appropriate solutions to overcome them. With 5W1H it is possible to obtain precise and accurate analysis so that these problems can be handled. The following is the 5W1H analysis based on the toner cartridge problem.

Table 3 : 5W+1H Analysis

Problem Factors	What	Who	Where	When	Why	How
Man	Lack of concern for empty toner cartridge stock	Technician	Work Area	Work Process	Lack of concern for empty toner cartridge stock	Technicians must prepare empty toner cartridges from yesterday so that the next day technicians don't have to bother looking for empty toner cartridges
Method	No Stock	Technician	Work Area	Work Process	No schedule has been made to store empty Toner Cartridges in a special rack	Scheduled to stock or store empty Toner Cartridges on the shelf to make it easier for technicians
Environment and problem of "returned goods"	The work area is very narrow	Technician	Work Area	Work Process	Not enough space and no empty Toner Cartridge storage space	A special shelf was made to put empty Toner Cartridges so that technicians don't have to bother looking for them again and the work area becomes neat

Proposed solution to the problem wasted time are :

1. Creating shelf to put an empty toner cartridge so that technicians don't have to waste time looking for the toner cartridge, and the work area looks neat.

Figure 1 : Toner Cartridge Shelf

Shelf length is 1 meter, the shelf capacity is 10 toner stacks (90 empty toner cartridges, the shelf material is 10 cm thick and the shelf is attached to the wall.

2. It is proposed to find a permanent store and a large place to store goods, because the current business is still rented.

Standard Time After Improvement

Average cycle time (CT)

Calculation of the average cycle time is the time obtained during the observation using a stopwatch.

CT = 6,68 minutes

Normal Time

Normal time is using equation as follow :

Normal time = Average cycle time * adjustment factor

Normal time = 6,68 minutes * 1,14 = 7,6 minutes.

Standard Time

Calculation of the standard time is using as follow :

$$Standard\ Time = Normal\ Time\ X \frac{100\ \%}{100\% - \%Allowence}$$

$$Standard\ Time = 7{,}6\ X \frac{100\ \%}{100\% - 34\%} = 5{,}11\ minutes$$

The difference between before and after improvement is 10,97 minutes – 5,11 minutes = 5,86 minutes.

Another suggestion is for companies to apply 5S principle. Which is also known as sort, straighten, shine, standardize and sustain.

In addition to the above principles, work performance improvements can be made including analyzing the condition of the workspace so that an ergonomic work area can be created by considering the aspect of the room area, which focused on the human centered design.

Human centered design is considered the human aspects as an operator. In this case the filling operator. One way is to measure the work area so that the optimal work area is obtained.

Employees are an important asset for companies, but often companies not paying attention to the needs and workers' interests [4].

4. Conclusion

The results of research on problems regarding printer ink refills show that the average standard time before improvement in repairing 1 empty Toner Cartridge unit is 10.97 minutes. After improvement was made by making shelves and separating filled and empty cartridge, the average standard processing time for 1 empty Toner Cartridge unit after repair was 5.11 minutes. so the difference in time between after and before the repair is 5.86 minutes.

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