

WAREHOUSE ANALYSIS USING 5S AND ABC CLASSIFICATION METHOD ON CV. KARYA JAYA

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ABSTRACT

Storage room or warehouse is one of the facilities available in every company to facilitate its operations. The warehouse which is a place to store inventory of goods before the goods are issued has several activities. Due to the space that is too wide and the workers' lack of attention to the arrangement of goods on the storage rack, CV. Karya Jaya were disorganized or untidy. The arrangement of items that are still untidy makes the warehouse look ineffective and inefficient. The method used is 5S (Seiri, Seiton, Seiso, Seiketsu, Shitsuke) and ABC classification. The purpose of conducting research is to determine the arrangement of the warehouse area so that the goods look neat and effective, then ABC classification is carried out so that the categorization of goods becomes neater and in accordance with the classification so that it can make it easier for workers to search for goods in the warehouse. After doing the research, the results were Seiri 75% (quite effective), Seiton 50% (less effective), Seiso 25% (ineffective), Seiketsu 0% (very ineffective), and Shitsuke 100% (effective). There are 3 class categories, namely class A (11 items), class B (16 items), class C (27 items), proposed improvements by providing 3 shelves with the code for each product class A yellow with a high frequency of demand, class B green with medium request frequency, class C is blue with low request frequency.

Keywords: 5S, ABC Classification, Storage Rack, Warehouse.

Introduction

A storage room or warehouse is one of the facilities that every company must streamline its operations. A warehouse that is a place where an inventory of goods is stored before they are used or removed have several activities. According to [1][2] a warehouse is a building used to store goods. Items stored in warehouses can be raw materials, semi-finished goods, spare parts, or in-process goods prepared to be absorbed by the production process. According to [3], the purpose of storage facilities and the function of warehousing in general is to maximize the use of existing resources in addition to maximizing service to customers with limited resources. Warehouse and warehousing resources are rooms, equipment and personnel. Customers need warehouse and warehousing functions to be able to obtain the desired goods quickly and in good condition.

CV. Karya Jaya is engaged in the field of services where products are sold in the form of stationery and books. Stationery sold in the form of pencils, ballpoint pens, pens, erasers, markers, etc. While the books sold are in the form of textbooks, novels, biographies, textbooks, etc. From the assortment of stationery and books sold in order to increase the warehousing section it is worth giving a room or Warehouse to store such stationery and books so that they are well stored, tidy and well maintained. One of them is to organize the Warehouse to look more efficient and effective and arrange the goods according to its criteria. Due to the spacious room, which is 300 m², then the irregular or untidy arrangement of items in the CV. Karya Jaya, the Warehouse looks untidy and inefficient due to the large number of items that are not well arranged. Improperly arranged goods are due to inattention from the owners and workers present in the warehouse. In arranging the Warehouse and classifying the goods, the study used the 5S method (*Seiri, Seiton, Seiso, Seiketsu, Shitsuke*) and ABC classification. According to [4][5] 5S is more than just cleaning. 5S involves improving the entire process in terms of management. 5S not only cleans and regulates an area, but usually also finds problems and opportunities.

The 5S concept is later known as the term 5R in the application of manufacturing and enterprises in Indonesia. According to [6], This classification of logistic items aims to distinguish very important, important, and not very important logistic items. Based on the above exposure, this study aims to organize the Warehouse area and classify products based on ABC classification[7][8]. With the organization of the Warehouse area and the classification of goods, it is hoped that the work environment in the CV is maintained. The Karya Jayas became more orderly and orderly.

Research Methods

A. 5S (*Seiri, Seiton, Seiso, Seiketsu, Shitsuke*)

Data collection is done by direct observation. According to [9][10], the assessment is by measuring the condition of the criteria that are implemented compared to the expected conditions. These criteria are of course a benchmark for knowing the extent of the application (5S), so that a comparison formula can be used to get a percentage assessment as follows:

$$\text{Percentage Implementation 5S} = \frac{\text{Implemented Criteria}}{\text{Total Criteria for Each Sub Variable}} \times 100$$

Based on this formula, if the researcher determines four measures for all criteria for each sub variable and 100% for the condition of the sub variable that fulfils the four benchmarks, then if the condition is only three criteria, it will be said that 75% is in accordance with the desired conditions. Furthermore, if only two criteria are implemented, it is said that the implementation is 50%, and if only one criterion is implemented, it is said that the implementation is 25% and if no criteria are implemented, it is said that the implementation is 0%.

Referring to [9][11] above, so that the final assessment results are in the form of qualitative statements, the percentage amount is used as the basis for determining the predicate. The following are the provisions in determining the predicate in this study:

- 1) If the 5S sub variable fulfils all four criteria then first the research gives a figure of 100%, then it is replaced with the predicate "Effective".
- 2) If the 5S sub variable fulfils the three criteria then the level of achievement of its application is given 75%, then replaced with the predicate "Quite Effective".
- 3) If the 5S sub variable fulfils two criteria, it is given a level of achievement of its application of 50%, then replaced with the predicate "Less Effective".
- 4) If the 5S sub variable fulfils one criterion, it is given a level of achievement of its application of 25%, then replaced with the predicate "Not Effective".
- 5) If the 5S sub variable does not meet the criteria at all, it is given a level of achievement of its application of 0%, then replaced with the predicate "Very Ineffective".

The checklist lattice regarding the application of 5S is as follows:

Table 1. Lattice of Checklist on 5S

Sub Variable	Indicator	Criteria
	Selection of items that are still in use and those that are no longer in use	Warehouse area where items that are no longer in use are selected
Seiri (Sortation)	Move unused items and equipment	Selection and checking of goods are conducted periodically There is no accumulation of unused goods in the warehouse area
	Arrangement of goods in the warehouse area	Availability of warehouse space to store unused components There is a place or shelf for storing tools according to their function All products are stored in a fixed place.
	Labeling for each item of goods	Labeling cupboards and shelves to make it easier to find items It looks neat and does not get in the way of work
Seiton (Arrangement)	Maintain cleanliness in the warehouse area	Complete cleaning equipment in the warehouse area Cleaning is carried out regularly by employees
	The condition of the work area, work facilities and work	Walls and ceilings are in good condition and free of dirt and dust.

Seiso (Cleaning)	tools are maintained clean, and in a comfortable and safe condition for workers	Vacuum cleaners, brooms, rags, and other cleaning tools are available
		5S checklists, schedules and routines are established and used
Seiketsu (Strengthening)	There are warning signs in the warehouse area	Employees regularly update the display boards
		There are warning signs and signs in the warehouse area to help you escape if a fire occurs
		Availability of tools for danger or emergencies.
Shitsuke (Habituation)	The work attitude of all personnel in the work area has shown positive habits (punctual, disciplined in work)	Use understandable language, maximize good and polite language
		There is no miscommunication between workers
		All workers actively provide suggestions for improvements both as a group and individually
		Able to socialize and work as a team in the work area

B. ABC Classification

ABC classification method data collection is by recording what products exist. By conducting interviews with officers or workers in the warehouse area[12][13]. At this stage, the classification of product data is carried out according to its use. The data is sorted starting from the smallest age of use and then classified into 3 classes, namely class A (fast moving) as much as 20% of the total items, class B (medium moving) as much as 30% of the total items, and class C (slow moving) as much as 50% of the total items. According to [14] the calculation for ABC classification is as follows:

$$\begin{aligned} \text{A Class} &= 20\% \times \text{Total Item} \\ \text{B Class} &= 30\% \times \text{Total Item} \\ \text{C Class} &= 50\% \times \text{Total Item} \end{aligned}$$

After obtaining the results of the ABC classification calculation, they are sorted from the largest to the smallest sales to sort the products on the storage shelves.

Results and Discussion

Based on data processing, a predicate can be determined which is a qualitative result regarding the implementation of 5S in the warehouse area of CV Karya Jaya. The recapitulation of quantitative data results which are processed into qualitative data is explained in table 2.

Table 2. Recapitulation Data on Total Achievement, Percentage and Prediction of 5S Implementation

No	Sub Variable	Total Achievement	Percentage	Predicate
1	<i>Seiri</i> (Sortation)	$\frac{3}{4} \times 100\%$	75%	Quite Effective
2	<i>Seiton</i> (Arrangement)	$\frac{2}{4} \times 100\%$	50%	Less Effective
3	<i>Seiso</i> (Cleaning)	$\frac{1}{4} \times 100\%$	25%	Ineffective

4	<i>Seiketsu</i> (Strengthening)	0/4 x 100%	0%	Very Ineffective
5	<i>Shitsuke</i> (Habituation)	4/4x 100%	100%	Effective

Data obtained from direct observation and interviews obtained 54 types of products that are often sold at CV. Karya Jaya. Of the 54 types of products, the ABC classification will be calculated and will be sorted based on frequency of use on the storage shelf. The following is the calculation for the ABC classification:

$$\begin{aligned} \text{Class A} &= 20\% \times 54 = 10.8 \approx 11 \\ \text{Class B} &= 30\% \times 54 = 16.2 \approx 16 \\ \text{Class C} &= 50\% \times 54 = 27 \end{aligned}$$

After obtaining the calculation results, the products are sorted according to their class, see table 3.

Tabel 3. ABC Classification of CV. Karya Jaya Product Data

Ti	Product Name	Category
1	Pilot Pen BPT-P Black	A
2	Faster C600 Black Pen	A
3	Pilot Pen BPT-P Blue	A
4	Notebook Kiky 38 Sheets	A
5	Notebook Sinar Dunia 38 Sheets	A
6	Snowman Pen V5 0,7 Black	A
7	Faster Pen C600 Blue	A
8	Faster C6 Pen No Cap Black	A
9	Faster C6 Pen No Cap Blue	A
10	Standard Pen AE7 0,5 Red	A
11	Standard Pen AE7 0,5 Black	A
12	Standard Pen AE7 0,5 Blue	B
13	Pilot Pen BPT-P Red	B
14	Snowman Pen V5 0,7 Blue	B
15	Joyko Pen GP-265 0,5 Black	B
16	Joyko Pen GP-265 0,5 Blue	B
17	Snowman White Board Marker Black	B
18	Snowman White Board Marker Blue	B
19	Snowman White Board Marker Red	B
20	Joyko Pencil 2B P-88	B
21	Joyko Pencil 2B 6161	B
22	Joyko Pencil 2B P-90	B
23	Joyko Pencil 2B P-9 3	B
24	Faber Castel Pencil 2B	B
25	Kenko Pencil 2B 6161	B
26	Staedtler Pencil 2B	B
27	Faber Castell Eraser EBTA dan SPMB	B
28	Eraser Staedtler	C
29	Eraser Faber Castell 187120	C
30	Joyko Eraser B40	C
31	Joyko Eraser B20	C
32	Joyko Eraser B40BL	C
33	Joyko Eraser ER-20BL	C
34	Butterfly Ruler 20 cm	C
35	Butterfly Ruler 30 cm	C
36	Iron Ruler 30 cm	C
37	Iron Ruler 20 cm	C
38	Sinar Dunia Notebook 58 Sheets	C
39	Kiky Notebook 58 Sheets	C
40	Snowman Drawing Pen 0,1	C
41	Snowman Drawing Pen 0,3	C
42	Snowman Drawing Pen 0,5	C
43	Drawing Book A4	C

44	Drawing Book A3	C
45	Square Notebook Sinar Dunia	C
46	Learning Coloring Book	C
47	Learning Reading Book	C
48	Learning Writing Book	C
49	Children Book Stories	C
50	Faber Castell Coloring Pencil	C
51	Joyko Coloring Pencil	C
52	Kenko Coloring Pencil	C
53	Faber Castel HB Pencil	C
54	Faber Castel H Pencil	C


Based on table 3, there are 54 types of products. Then it is classified into three categories, namely A, B, C. Category A consists of 20% items, namely 11 types, category B consists of 30% items, namely 16 types, and category C consists of 50% items, namely 27 types. Before being classified into three categories, the products are sorted according to how often the product is sold.

A. Proposed Improvements

a. *Seiri* (sorting)

Table 4 *Seiri* and Proposed Improvements

No	Before Improvement	Improvement Proposal
1	There is a buildup of unused items.	Sort unused items and store them in the place provided.

b. *Seiton* (Arrangement)




This article proposed improvement is to use the ABC classification method. The first step is to code the goods or products, so they are easy to reach and organize. After giving a code to the product to distinguish class A, B and C classifications, the author gives color to the product code. According to [15], goods with code C are blue, goods with code B are green, and goods with code A are yellow. Based on the results of data processing, there are 54 types of products that will be classified. Then it is classified into 3 categories, namely A, B, and C. Category A consists of 11 types of items, category B consists of 16 types of items, and category C consists of 27 types of items.

Goods with code A are goods that have a very fast or frequent frequency of use. Goods with code B are goods that have a medium frequency of use. Meanwhile, goods with code C are goods that have a slow movement frequency. With products arranged in the right categories, it can make it easier for employees to search for goods or products without taking a long time and neatly. By using the ABC classification method, the categorization of goods looks organized and neat. Figure 1 is the sequence of ABC classification goods shelves and product codes that have been determined by the author and employees.



Figure 1. ABC classification

Table 5. *Seiton* and Proposed Improvements

No.	Before Improvements	Proposed Improvements
1.	<p>There are some products that are not stored in a fixed place.</p> 	<p>Products are stored in a fixed place. And placed according to the product classification that has been determined.</p> <p>1) Figure 4.1 Shelf 1 2) Figure 4.2 Shelf 2 3) Figure 4.3 Shelf 3</p>
2.	<p>The appearance is not neat and obstructs workers' paths.</p> 	<p>Tidy up the appearance and remove items blocking the road.</p> 

c. *Seiso* (Cleaning)



Table 6 *Seiso* and Proposed Improvements

No	Before Improvements	Proposed Improvements
1	Lack of complete cleaning equipment in the warehouse area	The workplace provides cleaning tools so that the warehouse is kept clean. For example, by providing dusters.

	
2 Cleaning is not done regularly.	Warehouse cleaning should be carried out regularly to keep the work environment and products good and well maintained.
	
3 The walls and roof ceiling are in dirty condition.	Clean the roof ceiling to keep the warehouse clean.
	

d. *Seiketsu* (Strengthening)

Table 7. *Seiketsu* and Proposed Improvements

No	Before Improvements	Proposed Improvements
1	There is no board for employees to schedule 5S routines.	Add boards on the side of the wall that are visible to workers to conduct 5S routines.
		

2 No display boards in use are regularly updated by employees

Conduct regular 5S display boards by employees.

AREA GUDANG	Rutinitas Checklist 5S							
	Perminggu			Minggu 1				
	Hari	Senin	Selasa	Rabu	Kamis	Jumat	Sabtu	Minggu
Memilih barang yang sudah tidak digunakan dan digunakan								
Tidak ada penumpukan barang yang sudah tidak terpakai								
Produk ditempatkan sesuai dengan tempatnya								
Menyapu lantai								
Membersihkan debu di area gudang								
Membuang sampah pada tempat yang disediakan								
Menyimpan alat kebersihan sesuai dengan tempatnya								
Melakukan jadwal rutinitas 5S								
Mengecek kondisi barang								

3 There are no warning signs in the warehouse area if a fire occurs

Provide warning signs in the form of fire alarms to prevent fires.



4 Unavailability of tools for danger or emergencies

Prepare fire extinguishers.



Conclusion

Warehouse analysis using the 5S method and ABC classification produces the best improvement proposals according to the author and local employees. With the proposed improvements to the goods warehouse, it will become more neat, well-maintained, organized, and make it easier for employees to carry out their work so that it becomes more orderly and orderly.

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