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Improving Spare Part Storage to Reduce Searching Time by Implementing 5S

Hirawati Oemar [1], Dea Legina Ayu Kusumah [1], Hery Hamdi Azwir [2]
[1)] Faculty of Engineering, Industrial Engineering Department, Univesitas Islam Bandung
Jl. Tamansari No.1, Bandung 40116
Email: hirawatio@yahoo.co.id, dealegina@gmail.com
[2)] Faculty of Engineering, Industrial Engineering Department, President University
Jl. Ki Hajar Dewantara, Kota Jababeka,Cikarang, Bekasi 17550
Email: hery.azwir @president.ac.id

Abstract

PT XYZ is a publishing, printing, security printing, and general trading enterprise. Because this organization employs several enormous pieces of equipment to carry out the manufacturing process, the spare parts utilized to sustain them are diverse. A large number of types of spare parts is a problem for the company because spare parts storage is not neatly organized, there is no data collection for incoming and outgoing spare parts, old and new spare parts are not separated, and spare parts are not arranged according to type, and there is no special mark on the parts. There is also garbage packaging from spare components in the storage room. This makes it harder for technicians to locate spare components and wastes time. This research intends to optimize the spare parts storage space by reducing movement waste so that technicians can conveniently find spare parts. Process flow maps are used to analyze spare parts storage, and the 5S approach is used for repairs (Seiri, Seiton, Seiso, Seiketsu, and Shitsuke). The 5S approach was used in the spare parts storage area at PT XYZ to manage the work environment and reduce spare parts search time from 218 minutes to 159 minutes.

Keywords: Storage, Spare Parts, 5S, Movement Waste, Search Time

Abstrak

PT XYZ merupakan perusahaan yang bergerak pada bidang penerbitan, percetakan, security printing, dan perdagangan umum. Perusahaan ini menggunakan banyak mesin besar untuk melakukan proses produksi, sehingga suku cadang yang digunakan untuk menunjang mesin pun banyak jenisnya. Banyaknya jenis suku cadang ini menjadi permasalahan bagi perusahaan karena penyimpanan suku cadang di perusahaan belum tersusun rapi, tidak ada pendataan untuk suku cadang yang masuk dan keluar, suku cadang lama dan baru tidak dipisah, suku cadang tidak disusun sesuai jenis, tidak ada tanda khusus pada tempat penyimpanan, dan terdapat sampah kemasan suku cadang pada tempat penyimpanan. Hal ini menyebabkan teknisi kesulitan ketika mencari suku cadang dan menimbulkan pemborosan gerakan (*waste of motion*). Penelitian ini bertujuan untuk memperbaiki tempat penyimpanan suku cadang dengan meminimasi pemborosan gerakan, agar teknisi mudah mencari suku cadang. Analisis pada penyimpanan suku cadang dilakukan dengan menggunakan peta aliran proses dan perbaikan dengan penerapan metode 5S (*Seiri*, *Seiton*, *Seiso*, *Seiketsu*, dan *Shitsuke*). Penerapan metode 5S pada tempat penyimpanan suku cadang di PT XYZ ini dapat mengatur lingkungan kerja dan meminimasi waktu pencarian suku cadang dari 218 menit menjadi 159 menit.

Kata Kunci: Penyimpanan, Suku Cadang, 5S, Pemborosan Gerakan, Waktu Pencarian

1. Introduction

PT XYZ is a company in manufacturing that runs publishing, printing, security printing, and general trading businesses. This company has a large machine to support the production process. These machines receive intensive care so that they are always in good condition and can be used whenever there is an order. The company has prepared spare parts to anticipate engine damage. The spare parts in the company are bearing

spare parts that can support different shafts to produce rotation, V-Belts which can transmit power to drive two shafts, spare parts pneumatic which uses a system with compressed air to be able to move the machine, relays that use electromagnetic principles to drive the machine, tucker blade which is used to cut paper, rubber cutting which is used for the base or retainer when the tucker blade cuts paper, folding blade which is used to fold the per the bolt is used as a fastener or connector between the two elements, and the nut is used as a locking bolt and object.

Parts storage at PT XYZ has not been neatly arranged, there is no data collection for incoming and outgoing spare parts, old and new spare parts are not separated, spare parts are not arranged according to type, and there is no special sign on the storage area, and there are waste packaging spare parts in the storage area. This makes it difficult for technicians to find spare parts and causes a waste of movement. Spare parts storage in the company must be improved to make it easier for technicians when looking for spare parts and minimize waste. The way to do this is to analyze the storage area spare parts by using process flow charts, as well as making repairs using the 5S method. The 5S method was chosen for repairs to spare parts storage because the 5S method is one of the tools in lean manufacturing that can regulate the work environment and eliminate waste.

The 5S method is also used in several other studies, either only with the 5S method or in combination with other methods, such as reducing the waste of time in the tractor production process with the 5S method (Morey, 2020), reducing the time to find workshop tools with the 5S method (Yadav et al., 2018), reducing movement waste in the shirt production process (Cristian et al., 2021) and the instant veil production process (Havi et al., 2018) with 5S, VSM, Process Activity Mapping, and 5 whys. In addition to reducing waste, 5S can also be used to solve other problems, such as improving the quality of screen-printed t-shirts with 5S and New 7 Tools (Oemar et al., 2020), increasing work productivity with 5S, fishbone diagrams, and 5w+1h (Reza and Azwir, 2019). In addition to enterprises, the implementation of 5S can also be carried out in educational institutions (Katare and Yadav, 2019).

2. Method

2.1 Storage

According to Darmono (2009) in Sudarmadi (2011), storage is an activity of managing and regulating the delivery of goods to the final user which consists of receiving, storing, and arranging goods, so that goods will be durable and easy to find when they are used. Several goals must be achieved in storage activities, namely as follows.

1) There is a classification for each tool and item.
2) Availability of storage space for goods that can meet:
   a. Stored goods safety.
   b. Protect items from damage.
   c. Easy retrieval of goods.
   d. There is a stock control system in place.

2.2 Spare parts

According to Yoseph (2013) in Arifin and Limbong (2016), spare parts are spare parts to replace damaged components in a machine unit.

1) Bearing Spare Parts
   Bearin0067s are machine elements that are capable of supporting different shafts and most often rub against each other when the engine is running. So that the bearing is not hot, it must have the following requirements (Masryukan et al., 2017):
   a. Resistant to wear and friction.
   b. Resistant to corrosion/rust.
   c. Resistant to shock.
   d. Resistant to heat.
   e. Strong and not easy to break.
2) V-Belt Spare Parts
   A V-belt is a transfer of power or motion between two shafts. The main function of the V-belt is to transmit engine power to drive the wheels through the friction between the pulley and the belt (Mayasari dan Dewi, 2016).
3) Pneumatic Spare Parts
   Pneumatic system s used in industry and factories, usually use systems with compressed air or compressed inert gas (Putra dan Haris, 2017).

4) Relay
   Relays are electromechanical parts or parts that can operate with electricity. The relay is made up of two parts: an electromagnet (coil) and a mechanical (Saleh dan Haryanti, 2017).
5) Rubber Cutting
   Rubber cutting is the rubber used for the base or holder when the tucker blade cuts paper.
6) Folding Blade
   A folding blade is an iron plate used to fold paper.
7) Tucker Blade
   The tucker blade is an iron plate-shaped knife used to cut paper.
8) Bolt
   A bolt is part of a machining component and is used as a binder or connector between two elements in addition to welding, soldering, and rivet connections (Handra dan Brazi, 2012).
9) Nut
   The nut is a mechanical device made from a mixture of metals. The function of the nut is as a fastener or to lock bolts and objects (Rosa et al, 2016).

2.3 Process Flow Chart

The process flow chart is a diagram that can show information about time (hours) and distance traveled (meters). The Process flow chart displays the sequence of operations, transportation, storage, inspection, and waiting during the production process (Sutalaksana et al., 2006).
The following are common uses of a process flow chart:

a. Knowing the activities of people or the flow of materials from the beginning to the end of the activity.
b. Give information on the completion time of a process.
c. This involves knowing the number of activities carried out by people or activities experienced by the material during the process.
d. As a tool to improve work methods.
e. As a tool to find out where work inefficiencies occur on a map that only describes the flow of a component or one person, it is used to eliminate hidden costs.

2.4 Lean Manufacturing

Lean Manufacturing is a business philosophy developed at Toyota Motor Company. The goal is to eliminate all forms of waste in the production process (Ehrlich, 2002).

2.4.1 Types of Wasting

According to Ohno in Carreira (2005), waste is all work activities that do not provide added value.

a. Waste of overproduction occurs because the company uses more equipment and machines than necessary, regardless of the machine output.
b. Waste of waiting occurs because the production line is not balanced, so operators wait for machines, equipment, and raw materials.
c. Waste of transportation, there is unnecessary movement around the production floor.
d. Waste of over-processing because the company makes product designs beyond the wishes of the customer.
e. Waste of inventory occurs due to excessive inventory in the process and finished goods.
f. Waste of motion occurs due to movement that is not required by the operator.
g. Waste of the defect occurs because the production process produces defective products so that rework is carried out.

2.4.2 Tools Lean Manufacturing

Lean Manufacturing has several tools and techniques that are often used, as follows (Voehl dkk, 2013).

1) Value Stream Mapping (VSM)
   VSM is a method for identifying and mapping the flow of information, processes, and goods throughout the supply chain, from raw material suppliers to customers.
2) Poka-yoke and Jig

Poka-yoke is a tool that is responsible for preventing defects in product design or production processes. While the jig is a tool in the manufacturing process to produce accurate duplicate components.

3) Total Productive Maintenance (TPM)
TPM is a strategy to create operators who have both responsibilities for machine monitoring and the authority to take corrective action if needed.
4) Visual Control
Visual control is a technique of making information about the production process and basic daily activities visually available.
5) Single Minute Exchange of Dies (SMED)
SMED is a method to reduce setup time. This method was developed by Shigeo Shingo at Toyota.
6) Work Standardization
Work standardization is a process for documentation and standardization of work along with value stream mapping.
7) Kanban
Kanban is Japanese for the card. Withdraw Scheduling combined with travel instructions delivered by cards, containers, etc.
8) 5S Workplace Organizing
The 5S method first appeared in the 1980s and was initiated by Takashi Osada. According to Osada (2002) in Farihah and Krisdiyanto (2018), 5S is an approach to managing the work environment and eliminating waste to create an effective, efficient, and productive environment.

The following is an explanation of 5S according to Osada (2002) in Mubarok (2018).

a. Seiri (Sort)
Seiri has the meaning of separating between what is needed and what is not needed. The purpose of Seiri activities is to establish criteria for items to eliminate unnecessary ones, perform management stratification, determine priorities, and orientate causes. The activities carried out are as follows:
- Basic sorting

Sorting is the art of getting rid of things that are not needed and keeping things that are needed. In sorting, stratification management is carried out to decide the importance of an item, reduce the inventory of items that are not needed, and ensure that the items needed are stored nearby to make them more efficient. Table 1 shows the sorting principle on Seiri.
- Carry out a major cleaning of the equipment to decide whether the tool is still needed or not.
- Sorting out usable and damaged equipment
- Throw away what you don't need
- Addressing the cause of the problem to prevent the problem from continuing.

Table 1. Sorting Principle on Seiri

No	Degree of Need	Frequency of Use	Storage Method
1	Low	Items that were not used last year	Throw away
		Items that have only been used once in the last 2-6 months	Keep it far away
2	Average	Items that have only been used within the last 6-12 months	Keep it in the middle of the work area
		Items that are used more than once a month	
3	Tall	Items used once a week	Keep it near the person who uses it or keep it in that person's shirt/pants pocket
		Items used every day	

b. Seiton (Set in order)
Seiton means to determine the layout of the storage of goods neatly. The goal is to determine the items stored, provide efficient layout and placement, and eliminate time spent searching. The activities carried out are as follows:
- Functional storage
- Practice and competition in storing and retrieving.
- Tidy up the workplace and equipment.
- Eliminate wasted time searching for items.

c. Seiso (Shine)
Seiso is also the activity of removing garbage and foreign materials from the workplace so that it is cleaner. The activities carried out are as follows:
- Make cleaning supplies available.
- Organize daily cleaning procedures.
- Carry out cleanliness in the work area.

d. Seiketsu (Standardize)
Seiketsu has the meaning of maintaining concise, neat, and previous rehearsals repeatedly so that the results that have been achieved are maintained by standardizing them.

e. Shitsuke (Sustain)
Diligent means personal discipline. People who practice being concise, neat, clean, and caring continuously become accustomed to it in everyday life. Widianti (2015) in Mubarok (2018), explains the positive impact of implementing 5S correctly.
- Problems can be found more quickly by everyone.
- Everyone pays more attention to the planning stage.
- Supports process-oriented thinking.
- More important and urgent issues are prioritized to be resolved.
- The construction of the new system will be accepted by everyone.
- Minimize the potential for work accidents, breakdowns, costs, and defective products.
- Increase efficiency and morale.
- Organizations that are ready to follow changes according to the direction of the leadership strategy.

2.5 Methodology

The following is a flow chart of the research steps, which can be seen in Figure 1.

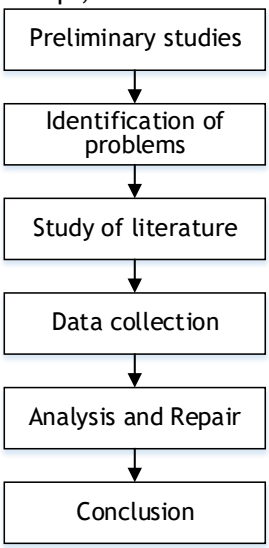

Figure 1. Research methodology

2.5.1 Preliminary studies

Preliminary studies relate to the identification of the current state of the enterprise. The activities carried out are observing the company directly and interviewing the technician department to find problems that will be the focus of the discussion. The object of the study was carried out in the spare part's storage area at PT XYZ.

2.5.2 Identification of problems

After a preliminary study was carried out, information was obtained about the problems contained in the company, namely the storage of spare parts in the company has not been neatly arranged, there is no data collection for incoming and outgoing spare parts, old and new spare parts are not

separated, spare parts are not arranged according to type, there are no special marks on the storage area, and there is spare parts packaging waste in the storage area. The problems that exist in this company are expected to be overcome using the 5S method. The next step is to determine the formulation of the problem based on the background that has been explained and the research objectives that can be known from the results of the research.

2.5.3 Study of literature

The literature study contains the theory that will be used as the basis for the research. The theory used comes from books or journals related to storage, spare parts, process flow charts, and lean manufacturing.

2.5.4 Data collection

The data collected is primary data and secondary data. Primary data is data from observations in spare parts storage areas and interviews with technician employees and technician managers. While secondary data is data from documents at PT XYZ.

2.5.5 Analysis and Repair

The analysis and repair stages are carried out to compare the current condition of the spare parts storage area with the condition after the repair. Analysis of the current condition is carried out using a process flow diagram. This process flow chart can show the time and activities performed to store and retrieve spare parts. In the process flow diagram of the current condition, some activities are wasteful and can cause the spare parts time to be taken longer. The implementation of 5S is carried out after knowing the cause of the problem in the spare parts storage area. Furthermore, an analysis of the repair conditions was carried out using a process flow diagram.

2.5.6 Conclusion

Conclusions are the final stage of the study. The conclusion contains the results of the overall data processing by the evaluation of improvements from the research results at PT XYZ.

3. Results and Discussion

3.1 Analysis of Process Flow Chart Before Repair

The process of storing and retrieving spare parts before the repair is shown in Figures 2 and Figures 3. In Figure 2, the activity of storing spare parts has not been collected data for incoming spare parts and spare parts are not arranged according to their type, so the time to save spare parts is 2891 minutes. In Figure 3, the activity of taking spare parts still has a process of finding spare parts. This

is because the storage process does not collect data and prepare spare parts, so the technician takes 218 minutes to pick up the spare parts.

PETA ALIRAN PROSES										
RINGKASAN							KOMPONEN		Sparepart	
KEGIATAN	SEKARANG		USULAN		BEDA					
	JML	WKT	JML	WKT	JML	WKT	PEKERJAAN		Penyimpanan	
OPERASI	5	2891					NOMOR PETA		1	
PEMERIKSAAN	0	-					ORANG □		BAHAN ■	
TRANSPORTASI	1	5					SEKARANG ■		USULAN □	
MENUNGGU	0	-					DIPETAKAN		Dea Legina AK	
PEYIMPANAN	1	-					TANGGAL		15 Oktober 2020	
JUMLAH	2896									
URAIAN KEGIATAN	LAMBANG						JARAK (CM)	JUMLAH	WAKTU (MENIT)	
Admin produksi membuat surat permohonan *sparepart*	●						-	1	5	
Surat permohonan diterima oleh logistik	●						-	1	5	
Melakukan pembelian *sparepart*	●						-	1	2880	
Sparepart tiba di gudang bahan baku	●						-	1	-	
Admin produksi mengambil *sparepart* dari gudang bahan baku			●				15000	1	5	
Sparepart diberikan kepada teknisi	●						-	1	1	
Sparepart disimpan di tempat penyimpanan					●		-	1	-	

Figure 2. Process Flow Chart Storage of Spare Parts Before Repair

PETA ALIRAN PROSES										
RINGKASAN							KOMPONEN		Sparepart	
KEGIATAN	SEKARANG		USULAN		BEDA					
	JML	WKT	JML	WKT	JML	WKT	PEKERJAAN		Pengambilan	
OPERASI	4	198					NOMOR PETA		2	
PEMERIKSAAN	1	15					ORANG □		BAHAN ■	
TRANSPORTASI	1	5					SEKARANG ■		USULAN □	
MENUNGGU	0	-					DIPETAKAN		Dea Legina AK	
PEYIMPANAN	0	-					TANGGAL DIPETAKAN		15 Oktober 2020	
JUMLAH	218									
URAIAN KEGIATAN	LAMBANG						JARAK (CM)	JUMLAH	WAKTU (MENIT)	
Operator melapor kepada Teknisi mengenai kerusakan mesin	●						-	1	3	
Manajer Teknisi mengecek kerusakan		●					-	1	15	
Merencanakan Perbaikan	●						-	1	15	
Mencari sparepart	●						-	1	60	
Sparepart dibawa ke mesin yang rusak			●				13670	1	5	
Perbaikan mesin	●						-	1	120	

Figure 3. Process Flow Chart Retrieval of Spare Parts Before Repair

3.2 Analysis and Repair

There is a search operation in the process of taking spare parts, which can be seen in Figure 3. This causes waste to occur. To be able to eliminate this waste, in the spare part storage process, additional spare part data collection operations are carried out so that it can be seen which spare parts are available and those that are not available in the storage area, as well as in spare parts storage operations, some rules must be applied when storing spare parts. This is done to make it easier to take spare parts and eliminate wasted movement. The rule that must be applied is to use the 5S method.

1) Seiri (Sort)
   a. Sorting is done by separating spare parts in the spare parts storage room according to their type and determining the level of importance for each spare part criteria consisting of new spare parts, old and reusable spare parts, and damaged spare parts. New spare parts are stored in the new spare parts

storage area, old spare parts that can be reused can be stored in the old spare parts storage area, and damaged spare parts will be discarded.

b. Carry out cleaning on spare parts so that it can be decided whether they are still needed or not.
c. Sorting damaged equipment by separating damaged spare parts from spare parts in good condition according to type.
d. Throw away what is not needed, such as damaged spare parts and cardboard or spare part packaging.
e. Overcome the cause of the problem by storing spare parts according to the criteria and according to the type.

2) Seiton (Set in order)

Seiton is done by arranging spare parts so that they are neat they can be found quickly by operators or technicians. The following are the steps for implementing seiton.

a. Functional storage by determining where to store spare parts according to the criteria and types so that technicians can find out where the spare parts are located so that the search process does not take long.
b. Practice and competition in storing and retrieving goods.
c. Level the workspace, shelves, and equipment.
d. Eliminate waste in finding goods by labeling the shelf according to the name and type of spare part.
e. Make a visual display in the form of an appeal to store spare parts in the space provided as in Figure 4.

Figure 4. Seiton Implementation Poster

3) Seiso (Shine)

Seiso is carried out by maintaining the cleanliness of the spare parts storage area, namely the environment, storage racks, and spare parts. The following are the steps taken for seiso implementation.

a. Make cleaning supplies available.
b. Organize daily cleaning procedures.
c. All employees carry out routine cleaning in the work area.
d. Create a visual display in the form of advice to keep the work environment clean as in Figure 5.

Figure 5. Seiso Implementation Poster

4) Seiketsu (Standardize)

Seiketsu implementation is carried out by maintaining seiri, seiton, and seiso so that it can take place continuously by making SOPs for spare parts storage and spare part collection. The following are the actions of the seiketsu program by making SOP for storage and retrieval of spare parts, which can be seen in Figure 6 and Figure 7.

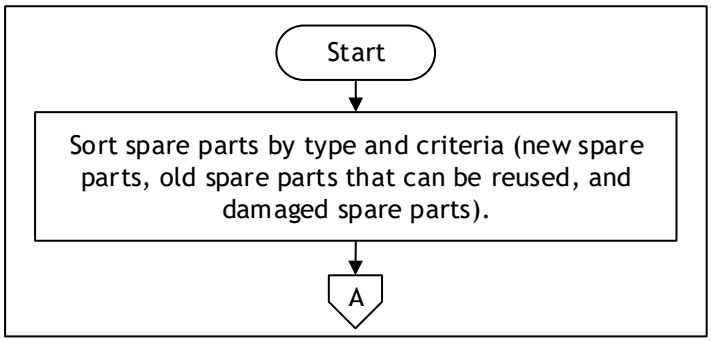

Figure 6. Proposed SOP for Storage of Spare Parts in the Implementation of Seiketsu

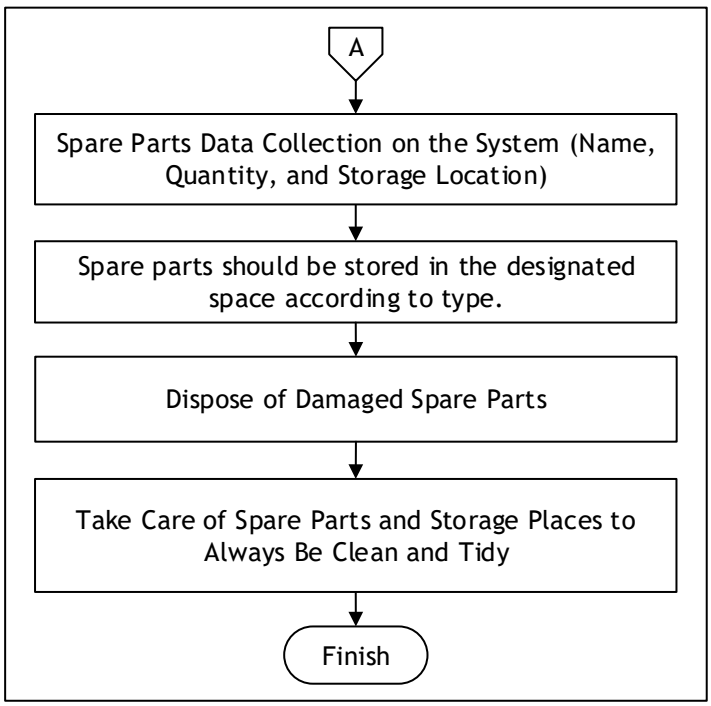

Figure 6. Proposed SOP for Storage of Spare Parts in the Implementation of Seiketsu (continued)

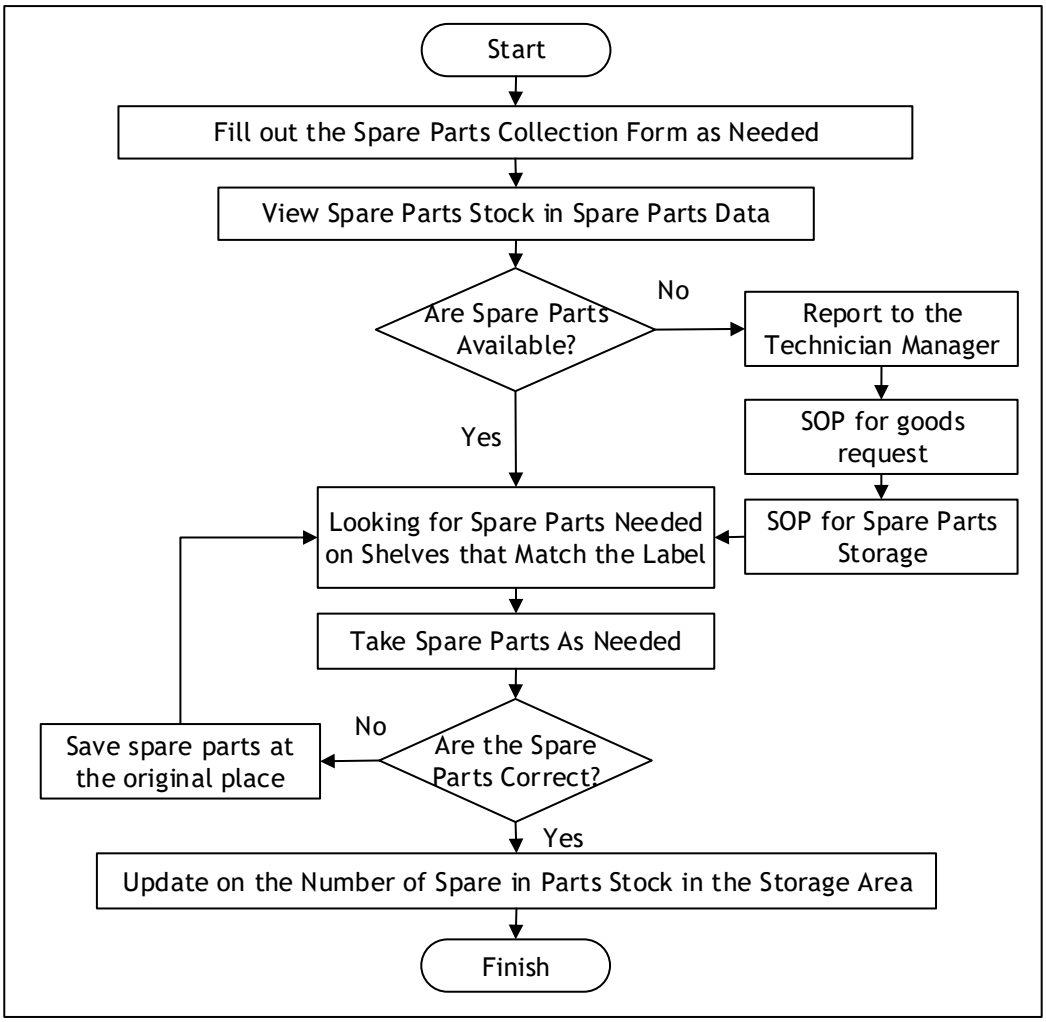

Figure 7. Proposed SOP for Retrieval of Spare Parts in the Implementation of Seiketsu

5) Shitsuke (Sustain)

Making workers accustomed to complying with rules and holding counseling for workers to work professionally and realize 5S as a work culture. The following is an action from the shitsuke program by making a visual display of 5S culture and work rules, which can be seen in Figure 8.

Figure 8. 5S Poster and Work Rules Poster on Shitsuke Implementation

3.3 Spare Parts Storage Conditions After 5S Implementation

After the implementation of 5S, spare parts storage in the company is neatly arranged, data collection is carried out for incoming and outgoing spare parts, separation of old and new spare parts is carried out, spare parts are arranged according to type, there is a special mark on the storage area, and the spare parts storage area is free from waste. The condition of spare parts storage before and after repair can be seen in Table 2.

Table 2. Spare Part Storage Conditions Before and After 5S Implementation

Before 5S Implementation	After 5S Implementation
	
	
	

Table 2. Spare Part Storage Conditions Before and After 5S Implementation (continued)

Before 5S Implementation	After 5S Implementation
	
	

3.4 After Repair Process Flow Chart

Figure 9 and Figure 10 show a process flow chart for spare parts storage and retrieval after repair. There was an increase in spare parts storage time, which was 2901 minutes. The addition of time occurs because there is an additional spare part data collection operation before the storage operation. This is done so that the spare part stock can be known. Even though there is additional time for spare parts storage activities, this can help reduce the time for taking spare parts. After implementing 5S, the activity of searching for spare parts can be eliminated. However, there were additional operations for filling out the retrieval form as well as viewing stock and viewing shelf numbers. Even though there was an increase in activity, this could reduce the spare part collection time to 159 minutes.

PETA ALIRAN PROSES										
RINGKASAN							KOMPONEN	Sparepart		
KEGIATAN	SEKARANG		USULAN		BEDA		PEKERJAAN	Penyimpanan		
	JML	WKT	JML	WKT	JML	WKT				
OPERASI	6	2896					NOMOR PETA	1		
PEMERIKSAAN	0	-					ORANG □	BAHAN ■		
TRANSPORTASI	1	5					SEKARANG □	USULAN ■		
MENUNGGU	0	-					DIPETAKAN OLEH	Dea Legina AK		
PEYIMPANAN	1	-					TANGGAL	15 Oktober 2020		
JUMLAH	2901									

URAIAN KEGIATAN	LAMBANG					JARAK (CM)	JUMLAH	WAKTU (MENIT)
	○	□	⇨	D	▽			
Admin produksi membuat surat permohonan *sparepart*	●					-	1	5
Surat permohonan diterima oleh logistik	●					-	1	5
Melakukan pembelian *sparepart*	●					-	1	2880
Sparepart tiba di gudang bahan baku	●					-	1	-
Admin produksi mengambil *sparepart* dari gudang bahan baku			●			15000	1	5
Sparepart diberikan kepada	●					-	1	1
Pendataan *sparepart* masuk	●					-	1	5
Sparepart disimpan di tempat penyimpanan					●	-	1	-

Figure 9. Flow Process Chart for Spare Parts Storage After Repair

PETA ALIRAN PROSES										
RINGKASAN							KOMPONEN	Sparepart		
KEGIATAN	SEKARANG		USULAN		BEDA		PEKERJAAN	Pengambilan		
	JML	WKT	JML	WKT	JML	WKT				
OPERASI	4	144					NOMOR PETA	2		
PEMERIKSAAN	1	15					ORANG □	BAHAN ■		
TRANSPORTASI	1	0					SEKARANG □	USULAN ■		
MENUNGGU	0	-					DIPETAKAN OLEH	Dea Legina AK		
PEYIMPANAN	0	-					TANGGAL DIPETAKAN	15 Oktober 2020		
JUMLAH	159									

URAIAN KEGIATAN	LAMBANG					JARAK (CM)	JUMLAH	WAKTU (MENIT)
	○	□	⇨	D	▽			
Operator melapor kepada Teknisi mengenai kerusakan mesin	●					-	1	3
Manajer Teknisi mengecek kerusakan		●				-	1	15
Merencanakan Perbaikan	●					-	1	15
Melihat Stok dan melihat no rak	●					-	1	5
Mengisi Form Pengambilan *Sparepart*	●					-	1	1
Sparepart dibawa ke mesin yang rusak			●			13670	1	5
Perbaikan mesin	●					-	1	120

Figure 10. Flow Process Chart for Spare Parts Retrieval After Repair

4. Conclusion

Based on the results of the analysis of existing problems at PT XYZ, the following conclusions can be drawn:

1) Before repairing the spare parts storage and retrieval process, it took 2896 minutes and 218 minutes, respectively.
2) Corrective actions are carried out by adding and subtracting activities in the flow chart process, as well as by applying the 5S method consisting of seiri (brief), seiton (tidy), seiso (dress), seiketsu (care), and shitsuke (diligent) on site. spare parts storage.
   a. Seiri: Sorting spare parts that are needed and not needed, cleaning spare parts, and disposing of unnecessary ones.
   b. Seiton: Determine where to store spare parts according to the criteria and types, make a label on the shelf according to the name of the spare part, and make a visual display in the form of an appeal to store spare parts in the provided place.
   c. Seiso: Providing cleaning tools, maintaining the cleanliness of spare parts and storage areas, making visual displays in the form of advice to keep the work environment clean.
   d. Seiketsu: Maintaining seiri, seiton, and seiso simultaneously continuously by making SOP for spare parts storage and spare parts retrieval.
   e. Shitsuke: Changing the attitude of employees of PT XYZto make 5S a work culture.
3) After repairs were made, the processing time for storing and retrieving spare parts was 2901 minutes and 159 minutes.

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