



## APPLICATION OF 5S (SEIRI, SEITON, SEISO, SEIKETSU, SHITSUKE) IN THE MOBILE SHOP WORK AREA AS AN EFFORT TO INCREASE WORK PRODUCTIVITY (CASE STUDY AT PT XYZ)

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### Abstract

*Brown paper and white paper are the two primary products manufactured at PT XYZ Mobile Shop Work Area, which is one of the supporting heavy industry operations engaged in the manufacturing of industrial goods. The finding of problems in the work area revealed that heavy equipment, specifically forklifts and trucks, has been damaged and is being stored together with normal ones. It is being done on purpose because there are parts that can cannibalize. Consequently, the space available to workers is limited, and neither management nor supervisors can regulate the working environment or ensure worker safety. In this study, we will compare the 5S design to the conditions that are currently in place. For this study, a qualitative approach known as the 5S method choose to conduct the research. As part of designing the layout for the seiton stage, the goods classify according to the shape they assume. The seiketsu location designing to provide visual control through labelling, marking, and area boarding to facilitate functionality. The shitsuke stage design carries out through activity execution by incorporating the 5S rule into the company's standard activity system. Following the completion of the maintenance, the working time can be reduced from 420 minutes to 405 minutes, representing a 4% reduction in total working time. Otif data to see work productivity in September and October 2022 averaged 96.15%, whereas the productivity / Otif value was only 91.60% in April 2022. Productivity increased slightly in September and October 2022, reaching 96.23% and 96.08%, respectively.*

**Keywords:** 5S, Work Productivity, Waste, Seven Tools, Time Efficiency.

### INTRODUCTION

The term "company" (bedriiff) is an economic concept that is utilized extensively throughout the Trade Law Code (KUHD). An individual who owns their own business is known as an entrepreneur. C.S.T. Kansil contends that a person can only consider running a company if he consistently and openly acts out in a specific job to make a profit in a way where he thinks he uses more capital than his energy. In other words, he must believe that he uses more worth than energy. As for the definition of a company quoted by Cindawati, from Prof. Molengraaff, "that a company is a whole of actions that are carried out continuously, acting out, to earn income, by trading goods, or entering into trade agreements." (Rofifah, 2020)

Based on observations during working hours at the PT XYZ company in the Mobile Shop section, it found that much heavy equipment was not classified. For example, heavy equipment was still standard, suitable for use or scrap all in one location, and the reason is that the spare parts can still cannibalize to narrow the workers' workspace and endanger p the work. In addition, there is no management or supervisor in charge of regulating the work environment and safety. As a result, the absence of a precise placement makes the work area untidy, and the worker finds it difficult to see what he is looking for; this results in a waste of time when carrying out work activities. In terms of safety, this untidy work area can cause hazards such as slipping or tripping. In addition, there still needs to be more concern about using personal protective equipment (PPE). These problems can indirectly reduce productivity and efficiency in work.

Based on the observations carried out according to the problems above, it is necessary to improve the appropriate workplace conditions in the work environment. One way to create a comfortable and orderly work environment is to properly implement 5S programs (Seiri, Seiton, Seiso, Seiketsu, Shitsuke).

By finding things that are important from the workplace to improve and things that are less important to get rid of or discarded to be comfortable during the process, maintenance takes place and can increase employee productivity.

With the improvement in the workplace, it hopes that it can increase employee productivity as seen from the fulfilment of the company's fulfilment order for the services produced can be maximized and increase productivity in working in the Mobile Shop section of PT XYZ

## METHOD

The 5S method (Seiri, Seiton, Seiso Seiketsu, and Shitsuke) first appeared in the 1980s and was initiated by Takashi Osada. The 5S method, as shown in Figure 1, is a method that can use to create and maintain the quality of the work environment in the organization. The definition of the 5S philosophy, according to (Risma, 2016), is as follows:

1. Seiri that is, setting aside unnecessary items with necessary ones or setting aside and disposing of unneeded items at work.
2. Seiton (stacking) neatly arranges the work tools used and eliminates the searching activity so that devices can easily find quickly.
3. Seiso that is, maintaining the cleanliness of the workplace.
4. Seiketsu maintains seiri, seiton, and seiso so it can continue continuously.
5. Shitsuke is a discipline that becomes a habit so that workers are accustomed to obeying the rules and counselling workers to work professionally.



Figure 1. 5S cycle

Source: *konsultantrainingiso.com*

Explaining that 5S also aims to keep the work environment safe, clean, comfortable and conducive (Widianti, S. Damayanti, and S. Sumaedi, 2015). States that 5S has a positive relationship with quality and productivity. If the 5S method is applied correctly, a positive impact will obtain on the company, namely (Listiani, 2010):

1. Everyone will be able to find problems faster.

2. Everyone will give attention and emphasis to the planning stage.
3. Support a process-oriented way of thinking.
4. Everyone will concentrate on more critical and urgent issues to solve.
5. Everyone will participate in building a new system.
6. Minimize the potential for occurrence:
  - Accident
  - *Breakdown*
  - Cost
  - *Defect* (defective product)
7. Increase efficiency and morale.
8. Organizations that are ready to follow the changes as directed by the leadership.

### **Order Fulfillment**

*Order Fulfillment* is a series of processes for fulfilling customer orders for a product. The process question is from receipt of the order, the process of preparing, and packaging, to the delivery order to reach the customer. *Order fulfilment* is vital in a business because it is directly related to customer trust. Just imagine if you, as a consumer, want to buy goods in a store, but these items are often only available sometimes. Of course, you will feel disappointed and look for other stores that can fulfil your order.

To calculate the Work Productivity Ratio in the shop car section, it can search through order fulfilment data sent to the customer on time & by the demand for the goods or often called a Fulfilment Order:

$$\text{Otif} = \frac{\text{Perfect order quantity}}{\text{Total order quantity}} \times 100\%$$

Total order quantity

Information:

*Otif* = *Full booking*

*Input*: The resources used to produce an *Output*. *Output*: The result achieved.

### **Fishbone diagram**

A fishbone diagram is one of the methods and tools to improve quality. This diagram is also known as the Cause-and-Effect Diagram quite frequently. In the 1960s, a Japanese scientist was the one who came up with the idea for it. The scientist's name is Dr Kaoru Ishikawa, born in Tokyo, Japan, in 1915. Dr Ishikawa is also a graduate of the University of Tokyo's chemical engineering programme. As a result, you might also hear it referred to as the ishikwa diagram. Initially, the method was applied

more for quality management, using verbal (non-numerical) or qualitative data. Dr Ishikawa is the first to introduce 7 tools or techniques of quality control (7 devices). Namely fishbone diagrams, control charts, run charts, histograms, scatter diagrams, pareto charts, and flowcharts. [4] The principle used to create this causal diagram is brainstorming. The main causal factors in this causal diagram can group into 1). Material (raw materials); 2) machine (machine); 3). Man (labour); 4). Method; and 5). Environment. An example of a fishbone diagram can see in Figure 2.

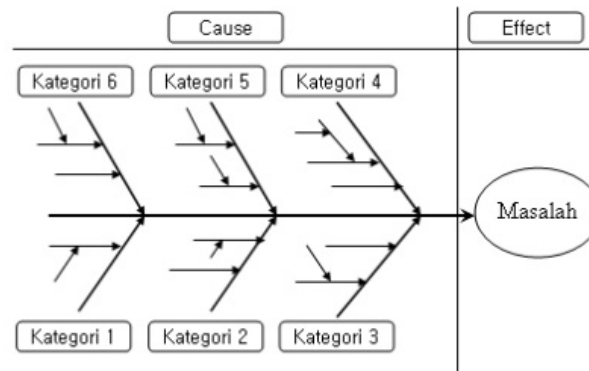


Figure 2. Fishbone Diagram

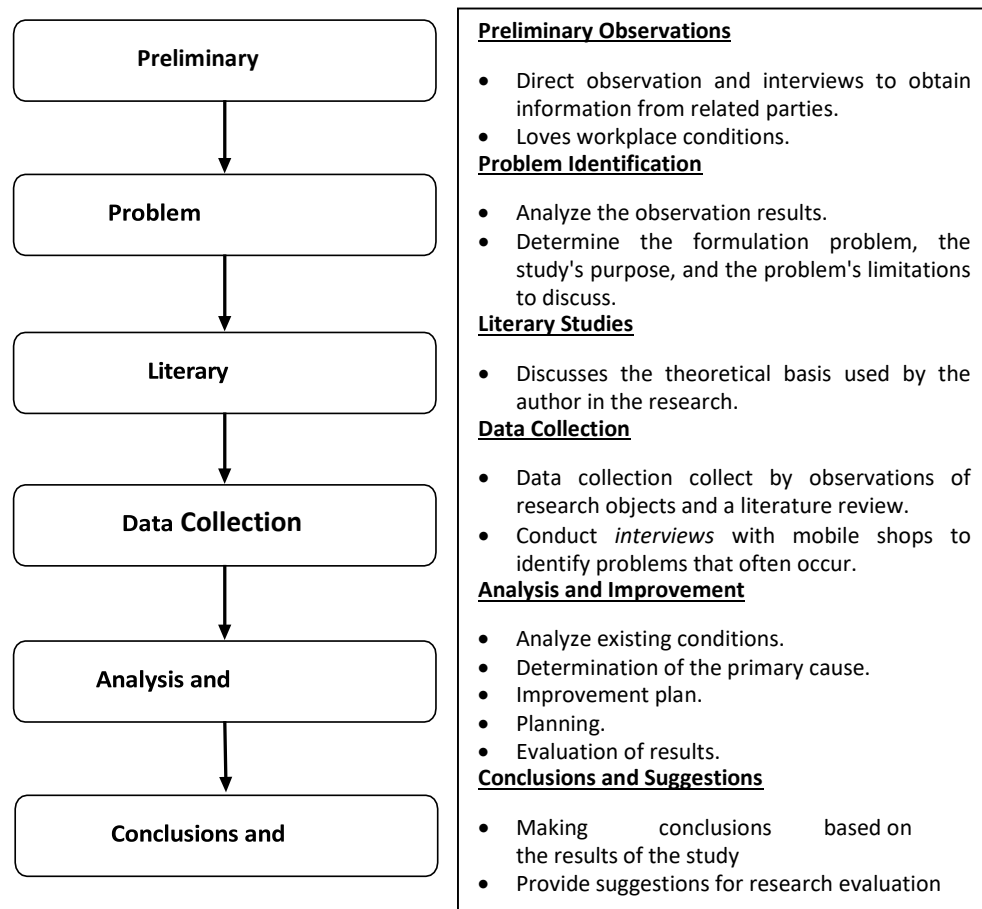
### 5W+1H Method

5W+1H is a method used to find out the problem in detail. In the form of several questions, namely: what, who, where, when, why and how (what, who, where, when, why and how) and usually presented in the form of a table, here is an explanation of 5W and 1H: What (what), a question aimed at finding out something that happened. Who (who) is a question aimed at finding out the person or subject who did something?

Where a question aimed at finding out where the event occurred. When (when), a question aimed at finding out the time of occurrence of an event. Why is a question aimed at finding out the background or cause of the event occurring? How (how) is a question aimed at discovering the process by which the event occurred. [5]

### Methodology

In Figure 3, you'll find a flowchart summarising the research process.



**Figure 3.** Research Methodology

**Preliminary observations**

The observation of the company is the first step in the process of conducting this study. In this process stage, interviews are carried out directly with the Mobile Shop Manager of PT XYZ and other employees to understand the existing circumstances better. Afterwards, observe the initial conditions in the working environment of PT XYZ Mobile Shop that are associated with the 5S program. For instance, this could include the presence of goods or equipment, the efficiency of work equipment used, and the cleanliness and orderliness of the working environment. It intentionally creates to ensure the successful execution of the program's design and implementation.

**Problem Identification**

From the results of preliminary observations, various problems were obtained, such as the discovery of a workspace that needs to organize better, the presence of work items/equipment that is no longer in the workspace and cleanliness that could be more optimal in some places. With these conditions, the implementation of 5S expects to overcome these problems. Therefore the research is focused on the

application of 5S. the next step determines the formulation of the problem background described. Then the problem formulation's purpose can select from the research results that will answer all the problem formulations—the problem's boundary chosen so that the research did not go outside the specified limits.

### **Literature Studies**

The literature study provides information and theories that can be used as a foundation for research and as a source of knowledge to assist in resolving issues. The theoretical foundation derives from the various references, such as books and journals, relevant to the research. At this point, many different theories connected to 5S utilize as a guide and basis for thinking concerning data processing, in addition to serving as a theoretical foundation for solving problems.

### **Data Collection**

The research team gathered their information for the study by conducting field observations, interviews with company employees, and scouring company documents for relevant information. A table organizes the collected data to identify any conditions that may exist more easily.

### **Analysis and Improvement**

At this point, an analysis performs by contrasting the existing circumstances with the suggestions for designing and identifying problems using one of the essential seven tools. This method can define problems, collect data, identify possible causes, identify root causes, propose solutions, and implement them. We support data from the proposed 5S design plan by conducting observation data, including primary and secondary data, by seiri (sorting), identifying, sorting, and separating units based on the classification of unit conditions.

The repair and damaged conditions; seiton (arrangement) by placing teams in the right location and codeficated according to unit conditions; seiso (cleaning) by cleaning all units according to the characteristics of the unit, seiketsu (maintenance) by doing cleaning (cleaning); checking inspection and repair activities, shitsuke by carrying out activities that make 5S a rule into the company's standard activity system, namely the Standard Operating Procedure (SOP) and to ensure the 5S program correctly and effectively, an evaluation.

### **Conclusions and Suggestions**

As the final stage of this research, a broad conclusion from the evaluation of improvements based on the study results and constructive suggestions to improve further the implementation of 5S in the following research at PT XYZ. This result derives from the evaluation of improvements based on the research results.

## RESULTS AND DISCUSSION

PT XYZ Mobile Shop Work Area will receive orders from all users of heavy equipment users without exception; whether it be for routine maintenance or damage due to use, the average piece of heavy equipment use 24 hours a day. Because of the mobile shop's mechanical limitations and the varying degrees of damage, there is frequently a buildup in the work area. It has a significant impact on the work environment, making it significantly more constrained, which in turn affects reducing employee productivity.

### Fishbone Diagram Analysis

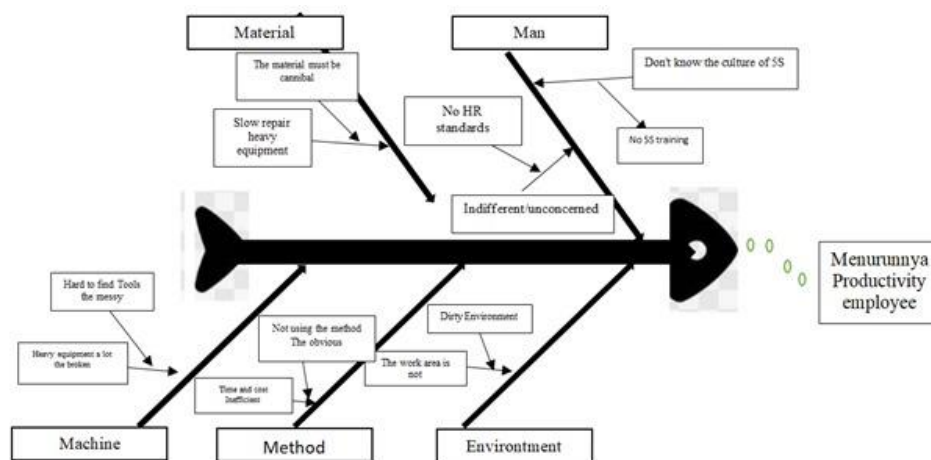


Figure 4. Fishbone Diagram

Each fishbone in Figure 4 represents a potential cause of the decline in productivity, which can be analyzed using the Fishbone Diagram. Utilizing a Fishbone diagram, you can identify the possible causes of the lengthy heavy equipment repair process. Human/employee factors in the workplace cause harm to machinery, materials, humans, and the environment. For the method, there is no use of measurable and continuous ways because it could be more efficient in time and cost due to tools that are difficult to find/messy.

So, a device must make it easier to pick up and see the tools you want to use without taking a long time when searching.

### 5W+1H analysis

As a benchmark for analyzing existing conditions, it connects with several factors, namely humans (man), machines (machines), materials, methods and the environment using 5W + 1H analysis. The results of the research obtained can be seen in the table as follows:

1. What (What?) The problem is the decline in employee productivity.
2. Where (Where?) This problem occurs in the work environment of the Mobile Shop section at PT

XYZ

3. This issue has been present for a significant amount of time up until now.
4. Who (Who?) This problem involves the methods section.
5. The issue is a lack of employee discipline and a shortage of facilities where employees can work.
6. How (How?) To solve the problems, employee discipline and providing facilities for employees to work must improve.

The analysis found the root of the problem that caused the decline in employee productivity. The reason is a lot of this waste occurs due to the taking of cannibal parts, the placement of components and tools far from the work environment, and the ordering of materials that are placed untidily and irregularly.

It causes a lot of waste of motion to appear and forces workers to get tired quickly due to this process. There is no sound working system, the room layout is still messy, cleanliness needs to be maintained, and security concerns still need to be raised. Then also the problem of placing documents and archives without clear labelling, so the time to search for old documents and archives is inevitable; therefore, this fundamental problem causes the maintenance process time to be too large and causes a decrease in employee performance productivity. Therefore, based on the existing issues, this study uses the 5S method to solve the problem for better results because many problems concern the human factor or employees and the safety of these employees.

### 5S Program Design

The following activities make up the sequence through which the design of the 5S is carried out:

#### *Seiri Planning (Simple)*

That is to set aside unnecessary items with the necessary ones or dispose of unnecessary items at work. The following are the steps that will take before designing seiri in the work environment in the Mobile Shop work environment at PT XYZ:

1. They are determining the criteria for necessary and unneeded goods. The requirements for goods based on the frequency of their use can be seen in Table 1.

Table 1. Criteria for Goods By Frequency

Frequency	Criterion	Storage Methods
Low	Spare parts require more than 6 months.	Placed outside of the working environment or disposed of in some other manner.
Keep	Spare parts used 2-6 months.	Store around the work area that will Used.
Tall	Spare Parts are used every day, weeks or months.	Store and place in an accessible work area is reached and picked up when you want to use it.

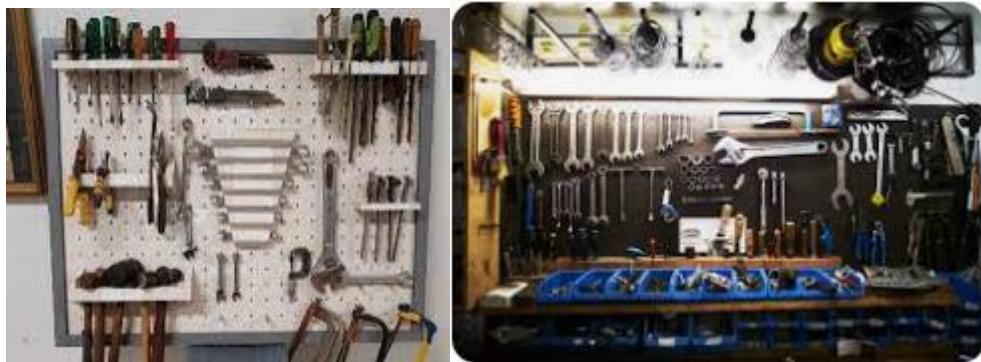
2. We are separating necessary and unneeded items.
3. Determine the actions performed for each item based on the frequency of use.

### **Seiton Design (Neat Neat)**

That is to organize the working tools, including documents and archives, use them neatly and eliminate the search activities so they can be easily found quickly. The following are the steps taken in implementing Seiton:

1. Determine the items/tools to be stored in the correct location.

The following proposed place for equipment storage in Mobil Shop can see in Figure 5.



**Figure 5.** Site Design Tools

2. Analyze the goods/tools to be stored.
3. Retrieving data on goods in the work environment in the work process
4. Determine the actions taken in carrying out the arrangement.

### **Seiso Design (Resik)**

That is, maintain the cleanliness of the workplace in terms of floors, goods, buildings and tools in the work environment. The purpose of designing seiso is to create a clean work environment because the cleanliness of the work environment can also indirectly affect the performance of every employee who works in the work environment. The following are the steps taken in designing Seiso:

1. We are providing cleaning tools in sufficient quantity and sufficient quality.
2. Carry out hygiene activities in the work environment regularly. Actions that need to be carried out to realize resin conditions are as follows:
  - Dispose of garbage in its place.
  - Setting up trash cans in every corner of the work environment.
  - Provide good cleaning equipment and adequate quality.
  - Each employee participates in maintaining cleanliness and doing it regularly in their workplaces due to

the absence of janitors.

- Procurement of a hygiene program before starting work activities means that every time you start work, both in the morning and evening, cleaning the workplace is carried out. With this activity, everyone is involved in 5S.

### **Seiketsu Design (Rawat)**

That is to maintain seiri, seiton, and seiso so it can continue continuously. Then preserve the existing conditions according to the standards. The following are the steps taken in designing Seiketsu:

1. Standardization of the workplace.

Standardization of the workplace is carried out in the form of setting up the layout of the workplace along with the work equipment used.

2. Poster 5S

The creation of this Poster is to motivate employees to always carry out the 5S work culture in the work environment and everyday life and place it close to the entrance. The 5S poster design can be seen in Figure 6.

3. Get used to the 5S procedure in daily activities.

The procedure in question is the duties and responsibilities of each employee associated with the implementation of 5S must comply with and implement it.



Figure 6. 5S Poster

### **Shitsuke Design (Diligent)**

Namely, as a discipline and become a habit so that workers are accustomed to obeying the rules and counselling is held to work professionally and realize 5S as a work culture in daily activities.

The steps taken in implementing Shitsuke are as follows:

1. Monthly Inspection

Cleaning checks are carried out by the relevant section once a month. It takes into account the cleanliness and tidiness conditions of the workplace. The monthly checksheet on PT XYZ can be seen in Figure 7.

FORMULIR 5S PATROL					No. Dokumen
Location:					Tgl. Dilaksanakan
Date:					Revisi
					Tgl. Revisi
0	1	2	3	4	Inspector
Berisi sesuai kegiatan 5S, tidak ada usaha sama sekali.	Sudah memulai kegiatan 5S, tetapi ada barang-barang yang perlu dipindahkan/dibersihkan.	Cukup baik, hanya perlu beberapa improvement minor (ada barang-barang yang perlu dipindahkan/dibersihkan).	Sudah baik, hanya perlu sedikit improvement.	Sudah sangat baik, harus dipertahankan kondisi seperti ini.	
5S/No.	Check Item	Description	(0-4)		
<b>STEP 1: Seiri, Ringkas</b>		Merupakan kegiatan menaruh dan membuang barang atau file yang tidak dipergunakan lagi.			Catatan atau komentar
1	Rakonan	Tidak ada makanan di area kerja			
2	Rampangan/bahan	Tidak ada benda yang tidak diperlukan berada di area kerja			
3	Order/ Dokumen	Order/ dokumen absolute di kotak atau sesuai prosedur			
4	Pengumpulan	Yang dipemerikan adalah yang terupdate			
5	Pengendalian Visual	Semua barang yang tidak diperlukan terhalang			
STEP 1 TOTAL SCORE					0
<b>STEP 2: Seiton, Rapi</b>		Merupakan kegiatan meyakinkan semua barang dan file.			Catatan atau komentar
6	Garis Pembagi	Semua garis pembagi jelas dan ada cat warnanya			
7	Label Rak	Semua rak dan barang terdapat label yang jelas			
8	Sign/Peringatan	Diletakkan ditempat yang telah ditentukan			
9	IBI	Terdapat simbol, label & MGS			
10	Akses Barudak	Peralatan keselamatan tidak terhalang			
STEP 2 TOTAL SCORE					0
<b>STEP 3: Seiso, Resik</b>		Merupakan kegiatan membersihkan tempat kerja, lingkungan kerja dan perlengkapan kerja secara rutin.			Catatan atau komentar
11	Lantai	Lantai bersih dan tidak licin. Jika hanya ada 2 jenis part.			
12	Meja/Peralatan	Selalu dijaga kebersihannya sesuai standar			
13	Tempat sampah	Tempat sampah tidak overloaf			
14	Peralatan Kebersihan	Peralatan kebersihan cukup dan disusun rapi			
15	Jadwal kebersihan	Ada jadwal khusus untuk kebersihan			
STEP 3 TOTAL SCORE					0
<b>STEP 4: Seiketsu, Rawat</b>		Merupakan kegiatan perawatan atau maintenance terhadap kegiatan Seiri, Seiton dan Seiso.			Catatan atau komentar
16	Pengisian Check Sheet	Check Sheet di isi sesuai jadwal			
17	Bergo	Tidak ada yang bergo kotor/kera berak merah			
18	Kondisi Lingkungan	Maka bersih, segar dan tidak berbau			
19	Visual Display	Standar-standar dengan display yang mudah dilihat			
20	Safety Patrol	Safety patrol dilakukan rutin min setiap bulan			
STEP 4 TOTAL SCORE					0
<b>STEP 5: Shitsuke, Rajin</b>		Merupakan suatu kebiasaan dan pemertahanan program 5S yang sudah berjalan.			Catatan atau komentar
21	Peraturan perusahaan	Berusaha menaati peraturan perusahaan			
22	Bergo	Menggunakan APD sesuai standar dan ID Card			
23	HAZ. Area manusia	Secara umum ada usaha untuk menghindari			
24	Pemeliharaan Sampah	Membantu pemeliharaan sampah			
25	Perbaikan umum	Kesan Inspector secara umum			
STEP 5 TOTAL SCORE					0
<b>TOTAL SCORE</b>					<b>0</b>

Figure 7 Monthly Checksheet

2. Provide strict regulations to every violating employee.

## EVALUATION OF RESULTS

### Evaluation of the Impact on Working Environment Conditions

An evaluation must be carried out to determine the results of the implementation of 5S. Evaluation is carried out using two ways. The first way is to compare the photos before and after the implementer on each side in the PT XYZ Mobile Shop section. If the work environment looks different, cleaner and neater, the planting of 5S culture can be said to be going well. The second way is to present in front of the head of the factory to compare with related parts. If the repair results are judged to be better than the corresponding section, they will get a reward & if the results are wrong, they will get Black as a "Warning" for parts that do not run 5S. 5S activities carried out in the PT XYZ Car Shop section are as follows;

#### a. Seiri Implementation (Brief)

Dispose of all unnecessary items, especially in the workshop area, so that heavy equipment maintenance activities are not disrupted. Unused items in the workshop area are selected in advance by selecting items that are still in use and those that are no longer used based on the frequency of use. Unused items will reduce the mobility of workers or operators, thereby reducing productivity and increasing the

risk of accidents in the workplace.

b. Seiton Implementation (Neat)

Tidy up the things around the Mobile Shop area and workbench to make it more organized and not messy.

c. Implementation of Seiso (Resik)

Implement seiso by removing dirt, garbage, and foreign goods from the workplace to keep it clean and ensure the process runs well. There has been a start in employees' awareness of the dirty work area's cleanliness. Before employees start their work activities, they clean first so that the Mobile Shop area is clean.

d. Implementation of Seiketsu (Rawat)

The implementation of seiketsu consists of continuing to practise what was previously covered step applying the concept of hygiene to oneself. Then maintain the existing conditions according to the standards. Standardize the workplace by providing regulations to train mobile shop employees who lack discipline and create a schedule for controlling 5S for employees on a rotating basis. Then making, posters have been placed in a place often seen by employees so that every employee notices that they will remember the 5S program and always comply with and familiarize themselves with the 5S program in their daily lives.

e. Shitsuke (Diligent)

Employees implement 5S through work norms, standardization and compliance with work procedures. The diligent application in the Mobile Shop line area emphasizes the work regulations made by the company. It checks the Monthly site, such as cleanliness, tidiness, studying the goods around, and returning goods after use.

Namely, by giving 5S violation points to employees who are later accumulated and, if they are already at the warning point, will be given a warning letter in the form of SP 1, which affects the achievements of employees in the company so that it leads to a reduction in employee salaries. If it still needs to be more effective, it can be emphasized by the termination of the contract or the employee's expenses. Diligent application of the place of tools by checking their condition after every work is like checking the state of the tools, whether they are still neatly arranged and also checking their cleanliness.

### **Productivity Comparison**

As previously described, the impact of implementing the 5S program in the Mobil Shop PT XYZ area was felt by all employees. They work effectively and more efficiently. It also brings a good and positive influence on the work of the Mobile Shop section. Here's the calculation of Otif in September and October 2022.

Data Otif ( Overtime and Fulfill) Maret - Oktober 2022								
	Maret	April	Mei	Juni	July	Agustus	September	Oktober
Jumlah Pesanan Total ( MT )	130.000	131.000	129.000	130.000	130.000	130.000	130.000	130.000
Jumlah Pesanan sempurna ( MT )	122.000	120.000	121.000	120.050	120.100	120.020	125.100	124.900
% Produktivitas	93,85	91,60	93,80	92,35	92,38	92,32	96,23	96,08

The following is a bar chart of Otif/ productivity of employee performance in September and October 2022 after the implementation of 5S, as shown in Figure 8.

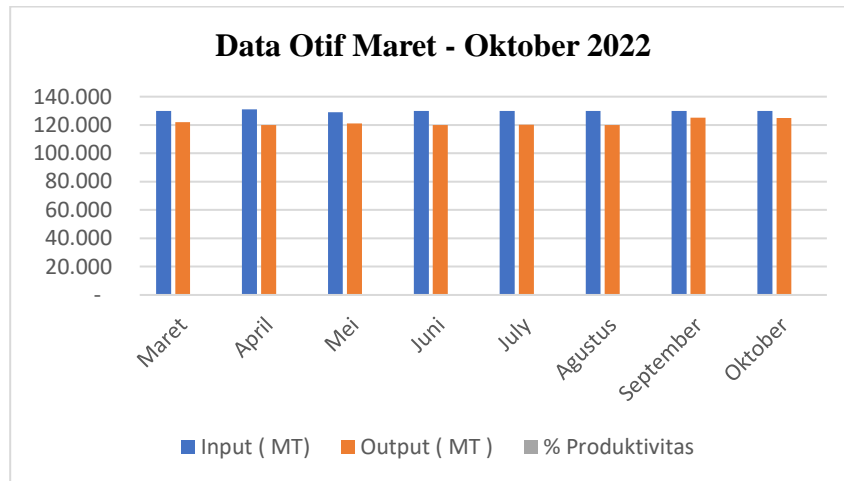


Figure 8. Fulfilment Orders Before and After 5S Deployment

## CONCLUSIONS

Implementing 5S at PT XYZ is an excellent first step toward increasing productivity because it will help the company motion waste issues arising in the Mobile work environment during all phases of the production cycle. From the initial handoff of heavy equipment to the User to the final inspection of finished products. Included in corrective actions is the 5S method:

1. Seiri: By selecting the necessary and unnecessary items that are in PT XYZ
2. Seiton: Organizes work tools, including documents and archives, that are used wholly and neatly to eliminate search activities so that they can be easily found quickly without waste of motion resulting in increased processing time.
3. Seiso: maintaining the cleanliness of the workplace in terms of floors, goods, buildings and tools in the work environment.
4. Seiketsu: Maintain seiri, seiton, and seiso by providing clear SOPs and regulations.
5. Shitsuke: Apply discipline to every PT XYZ Mobile Shop employee and carry out monthly inspections conducted by the head of the Mobile Shop section.

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