The Effect of 6S Work Culture on Operator Performance of Machine Shop and Weld Shop PT Cameron Systems Batam

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Abstract-This study aims to determine the effect of 6S culture on operator performance at PT Cameron Systems. 6S is a process to ensure that work areas are systematically clean, safe, and organized for efficiency and effectiveness. The results of this study are sustaining variables that have a positive and significant influence on employee performance. Safety variables have a positive and significant effect on employee performance. Variable sort has a positive and not significant effect on employee performance. Standardize variables have a positive and not significant effect on employee performance. While the variable set in order has a negative and not significant effect on employee performance. The shine variable has a negative and not significant effect on employee performance. Safety, sort, set in order, shine, standardize and sustain have positive effect as simultaneous on employee performance.

Keywords: Work Culture, 6S, Employee Performance

I. INTRODUCTION

In this era of globalization, every manufacturing company has experienced rapid development and progress. Not only Technology, but also includes Work Culture, Human Resources (HR). Human Resources (HR) are people who design, produce goods or services, supervise quality, market products produced, allocate finance, and formulate each strategy and goals of an organization (Samsudin, 2010).

Companies need humans who have good quality to support the company, because what determines the achievement of the success or failure of a company is the human resources concerned. For this reason, we need human resources with optimal performance and have an excellent individual work.

The company's work culture is needed for the development of the company in the face of very tight industrial competition. To create and improve work culture and corporate culture, a lot of effort is needed to achieve it.

According to research conducted by (Ramadhan, Bachri, & Dewi, 2014) the 5S program (Seiri, Seiton, Seiso, Seiketsu and Shitsuke) is the basis for the mentality of employees to carry out improvements and to realize good quality awareness. PT Cameron Systems Batam is a large company engaged in manufacturing producing oil and gas mining machinery and equipment and is a multinational company from America and has branches in several countries, one of which is in Batam, Indonesia. The company is implementing the CMS (Cameron Manufacturing Systems) as a form of awareness of the importance of the state of the work environment. One way to implement CMS is to do a 6S culture, namely: Safety, Sort, Set in order, Shine, Standardize, and Sustain. This 6S culture comes from the Kaizen culture. There are 5 points in kaizen consisting of seiri (sorting), seiton (set in order), seiso (shine), seiketsu (standardize) and shitsuke (sustain). However, at PT Cameron Systems, there is an addition of 1 point, namely safety. Safety is an important and main thing in the PT Cameron System and there must be every work done.

There are a number of things related to the phenomenon at PT Cameron Systems Batam based on observations and discussions about events that occurred in 2018, such as: (1) Disconnecting webbing slings in the Machine shop caused by the operator not finding the base for the lifting process using a crane so that the operator does it with shortcuts, (2) Some operators who waste time just looking for tools due to sharing tools, after one operator uses these tools and is not returned, (3) Operators are still lacking in cleaning activities (shine) that are carried out every day at the end of the shift, (4) Mixed equipment used and those that are no longer used (damaged), (5) During the audit, auditors find easy finding related to 6S, this affects the effectiveness of the work of the operator, and can have an impact on the audit scoring for 6S.

II. LITERATURE REVIEW

A. Work Culture

Initially the term culture was known in the discipline of anthropology. The word culture has the word meaning that is mind or reason. Budi or reason comes from Sanskrit namely "Buddhayah". The word culture means to work, derived from the word "Colere". The term culture develops, so that it has meaning as all forms of human power and effort in changing nature (Handayani, 2017).

Culture according to Schein (2010) is a form or pattern learned by certain groups to solve and solve problems related to adaptation to the outside environment and official internal integration and has been going well. Furthermore, Schein (2010) describes the elements of culture, which consists of: Scine, art, moral beliefs, law, customs, behaviour, learning value system or inheritance, basic assumptions of community...
habits, and problems in adaptation to the outside environment and internal intermingling.

B. 6S

According to Tripsa (2017) in the playbook regarding 6S, 6S is a foundation or foundation for lean manufacturing. 6S is a process to ensure that work areas are systematically safe, clean and organized for efficiency and effectiveness. She also stated that the purpose of 6S is in the playbook to establish and bind employees with the use of standards and discipline to regulate the organization.

Some of the benefits that can be obtained in the playbook (Tripsa, 2017) if implementing 6S are: (a) reducing the cycle times, (b) increase distance on the floor, (c) safer work area conditions, (d) improve employee performance, (e) reducing waiting time, (f) improve inventory management, (g) improve customer satisfaction, (h) strengthen communication, (I) improve quality, (j) reducing the time of searching and (k) reduce traveling time.

C. Safety Concept

Safety or what is meant by work safety. According to (Bangun, 2012) Occupational Safety is a protection or prevention of occupational safety experienced by workers both mentally and physically in the work environment. He also stated that, there are three basic reasons for work safety which is an obligation for every company, to carry out or carry out it, among others are economic, legal, and moral reasons.

D. Concept of Sort

According to research (Handayani, 2017) Sort is separating items that are still needed with those that are not needed, then removing items that are no longer needed. Goods that are not needed means that the item is no longer needed for current production activities. Sort can be measured through dimensions including: (a) get rid of items or materials that are not used anymore, (b) restricted work area, (c) separation of work equipment, (d) determine the frequency of use of each item in the work area, (e) separating items that are still used and those that are not used, (f) get rid of items that are not used with red tags in accordance with the procedure.

E. Concept of Set in Order

According to (Handayani, 2017) Set in Order or arrangement is storing goods - goods in a place that has been set or in the right layout so that it can be used in urgent situations. Set in Orders can be measured through dimensions including: (a) shelves, baskets and storage areas, (b) storage label, (c) line marker, (d) work equipment, (e) checklist (form). Handayani (2017) also stated that, there are several things that must be considered in the concept of set in order, namely: (a) every item has a place, (b) every place has identification for certain items, (c) make it organized or organized and systematic, (d) give a name or label to each storage place that is easy to find and remember, can use labels on storage places, (e) in the work area there must be items needed by the operator to support the work, (f) A place to work on paperwork is available, (g) available places to put material, tools and gages, (h) shadow board for markers, (i) label maker for labels and (j) signs.

F. Concept of Shine

According to (Handayani, 2017), this concept always prioritizes about the cleanliness of each work area or equipment used to maintain neatness and cleanliness. Shine is a cleansing process, where an area is swept and then mopped up with a mop. The purpose of shine is to make the work environment clean so that it will get a comfortable work environment and can improve the performance of workers.

G. Concept of Standardize

According to Handayani (2017) standardize is a continuous effort to maintain the 3S above, namely sort, set in order, and shine. Basically, trying to make the work area that has undergone repairs can always be maintained. The purpose of Standardize is to standardize the work culture that has been applied, so that every work carried out in work culture 6S has a reference that can be applied by all workers. Standardize can be measured through dimensions including: (a) 6S Control, (b) equipment and machines, (c) form 6S, (d) giving a sign, (e) standard labels and shadow boards (f) marker line, (g) form 6S, (h) standard pictures.

H. Concept Sustain

According to (Handayani, 2017), Sustain is a method that aims to invite or motivate workers to carry out and contribute to maintenance or maintenance activities that are continuously in repairs and make workers accustomed to obeying established regulations. The purpose of Sustain is to achieve 6S culture so that it can produce good performance. Sustain can be measured through dimensions including: regulations, procedure, routine activities, habits, discipline, repair, implementation technique, implementation of the 6S checklist, teach operators to fill out a daily checklist.

I. Employee performance

According to (Bangun, 2012) Performance is the result of the work that has been achieved by someone based on the requirements - job requirements implemented. A job has certain requirements to be carried out in achieving a goal which is also called a work standard (standard job). To facilitate the assessment of employee performance, each standard of work must be clearly measured and understood. A job can be measured through the following indicators: job quantity, quality of work, punctuality, presence.

J. Effect of 6S Work Culture on Employee

According to research conducted by (Ramadhani, Bachri, & Dewi, 2014) the 5S program (Seiri, Seiton, Seiso, Seiketsu and Shitsuke) is the basis for the mentality of employees to carry out improvements and to realize good quality awareness. According to research from (Handayani, 2017) that employee performance is certainly very influenced by human work culture. And it must be realized that culture is closely related to humans. The stronger the work culture, the higher the commitment and ability felt by employee.
According to previous research, Ramadan, Bachri, & Dewi (2014) shows that seiri, seiton, seiso, seiketsu and shitsuke have a significant effect on employee performance, according to the results of previous studies Hakim, Musadieq, & Nurtjahjono, (2016) the variable kaizen culture has a direct influence on the performance of karawan. Accordance with the theory described by Imai (1986) that kaizen (5S Culture) is a change that is carried out continuously to lead to perfection. To explain the way of thinking, Figure 1. is a framework that has been arranged for this study.

III. METHOD

A. Population and Sample

The population of this study are all Operators in the Machine shop and Weld shop area in Oktober 2018. A total of 51 people using saturated sample techniques.

B. Data Collection Techniques.

Data collection techniques used to measure research variables are questionnaires distributed to all samples. There are seven variables that are measured using indicators of each variable. The variables are safety, sort, set in order, shine, standardize, sustain and Employee performance.

C. Data Analysis Technique

Data were analyzed using multiple regression analysis to see the relationship and the magnitude of the influence of the work culture variable 6S on employee performance.

IV. RESULTS AND DISCUSSION

A. Descriptive Statistics Analysis

Descriptive statistics are statistics used to analyze data by explaining or describing existing and collected data as they are without intending to draw general conclusions or generalizations.

| Variable | N | Range | Minimum | Maximum | Mean | Median | Std Deviation | Variance |
|----------|---|-------|---------|---------|------|--------|---------------|----------|
| Safety   | 51 | 3     | 9       | 12      | 11.14 | 11.14  | 1.114         | 1.243    |
| Sort     | 51 | 3     | 9       | 12      | 10.41 | 10.41  | 1.218         | 1.482    |
| Set in Order | 51  | 3     | 9       | 12      | 18.00 | 18.00  | 1.822         | 3.328    |
| Shine    | 51 | 3     | 9       | 12      | 10.40 | 10.40  | 1.210         | 1.451    |
| Standardize | 51 | 3     | 9       | 12      | 14.08 | 14.08  | 1.485         | 2.209    |
| Sustain  | 51 | 3     | 9       | 12      | 21.32 | 21.32  | 2.190         | 4.789    |
| Y Kinetik| 51 | 6     | 14      | 20      | 17.31 | 17.31  | 1.935         | 3.755    |

Based on the table 1, the number of data for each variable is 51. For the safety variable the lowest value is 9 and the highest value is 12. The total safety value is 568 with an average of 11.14. Safety standard deviation is 1.114. For the sort variable the lowest value is 9 and the highest value is 12. The total value of the sort is 541 with an average of 10.61. The standard deviation of the sort is 1.218. For the set-in order variable, the lowest value is 15 and the highest value is 20. The total set in order value is 918 with an average of 18.00. The standard deviation of the set-in order is 1.822. The lowest shine variable is 9 and the highest value is 12. The total shine value is 535 with an average of 10.40. The standard deviation of the shine is 1.239. For the standardize variable the lowest value is 11 and the highest value is 16. The total standardize value is 716 with an average of 14.04. The standardize standard deviation is 1.483. For sustain variables the lowest value is 18 and the highest value is 24. The sustain value total is 1077 with an average of 21.12. The sustain deviation standard is 2.169. For the performance variable the lowest value is 14 and the highest value is 20. The total value of performance is 893 with an average of 17.51. The standard deviation of performance is 1.933.

B. Multiple Regression Analysis

From the results of the data on Table 2, it can be seen that sig safety value is 0.745, sort is 0.464, set in order is 0.411, shine is 0.909 and standardize is 0.533 where the value is> 0.05. This shows that safety, sort, set in order, shine and standardize do not affect employees. While the sig sustain value of 0.000 <0.05 has an influence on employee performance.
The form of the equation from the calculation of the regression value from the table above is as follows:

\[ Y = 0.909 + 0.053X_1 + 0.138X_2 - 0.082X_3 - 0.017X_4 + 0.012X_5 + 0.699X_6 + e \]

From the results of table, regarding multiple regression analysis, it can be seen that the value of 0.909 is a constant value (a). The value of 0.053 is the coefficient of safety and is a value of b1. The value of 0.138 is the coefficient of sort and is a value of b2. Value -0.082 is the coefficient value of set in order and is a value of b3. Value -0.017 is the value of the shine coefficient and is a value of b4. The value of 0.102 is the value of the standardize coefficient and is a value of b5. While the value of 0.699 is a sustain coefficient and is a value of b6.

From the output using SPSS 24, it is known that the coefficient of determination (R Square) is 0.778. The value of 0.778 is the squaring of the correlation coefficient or R, which is 0.882 x 0.882 = 0.778. The number of 0.778 is equal to 77.8%. This number implies that safety, sort, set in order, shine, standardize and sustain affect the performance of 77.8%. While the rest (100% - 77.8% = 22.2%) is influenced by other variables outside of this regression model.

C. Hypothesis testing

The t statistic test in principle shows how far the influence between one explanatory variable or independent individually in explaining the variation of the dependent variable.

From the results of the t test carried out using SPSS 24, it can be known as follows:

**TABLE III. T TEST**

| Model | Unstandardized Coefficients | Standardized Coefficients | t | Sig. |
|-------|-----------------------------|--------------------------|---|-----|
| (Constant) | 0.909 | 0.909 | 1 | 0.364 |
| Safety | 0.053 | 0.053 | 0.631 | 0.527 |
| Sort | 0.138 | 0.138 | 0.067 | 0.735 |
| Set in order | 0.082 | 0.082 | -0.677 | 0.511 |
| Shine | 0.017 | 0.017 | -0.411 | 0.686 |
| Standardize | 0.12 | 0.12 | 0.019 | 0.989 |
| Sustain | 0.699 | 0.699 | 0.792 | 0.496 |

a. The effect of safety on performance in the t test results obtained sig 0.745, then 0.745 > 0.05 and tcount 0.327 <ttable 2.017, it can be concluded that the safety partially does not affect employee performance.

b. The effect of sort on performance in t test results obtained sig 0.464, then 0.464 > 0.05 and tcount 0.327 <ttable 2.017, it can be concluded that sort partially does not affect employee performance.

c. The effect of set in order on performance in the t test is obtained sig 0.411 results, then 0.411 > 0.05 and tcount -0.831 <ttable 2.017, it can be concluded that the set in order partially does not affect employee performance.

d. The effect of shine on the performance of the t test results obtained sig 0.909, then 0.909 > 0.05 and tcount -0.115 <ttable 2.017, it can be concluded that the shine partially does not affect employee performance.

e. The effect of standardize on the performance of the t test results obtained sig 0.533, then 0.533 > 0.05 and tcount 0.629 <ttable 2.017, it can be concluded that standardize partially does not affect employee performance.

f. The effect of sustain on performance in the t test results obtained sig 0.000, then 0.000 <0.05 and tcount 6.356 <ttable 2.017, it can be concluded that sustain partially does not affect employee performance.

From the results of data obtained there are effects between safety, sort, set in order, shine, standardize, and sustain on employee performance. The results of the F test are Hypothesis in the form of: H0: There is an influence of 6S work culture (safety, sort, set in order, shine, standardize and sustain) simultaneously on employee performance.

The results of statistical calculations show the value of Fcount = 25.743 with a significance degree of 0.000 <0.05 and Ftable 2.32. So that the value of Fcount is 25.743> Ftable 2.32, simultaneously the variables of safety, sort, set in order, shine, standardize and sustain have an influence on employee performance.

In multiple regression analysis, results have been obtained which describe the variable influence of safety, sort, set in order, shine, standardize and sustain on employee performance.

1. Effect of safety on employee performance. Safety partially does not affect the performance of employees at PT Cameron Systems Batam. This is indicated by the results of the research data where the results of sig 0.745 are obtained, then 0.745> 0.05 and tcount 0.327 <ttable 2.017.

2. Effect of sort on employee performance. Sort partially does not affect the performance of employees at PT Cameron Systems Batam. This is indicated by the data from the research where the results of sig 0.464 are obtained, then 0.464 > 0.05 and tcount 0.327 <ttable 2.017.

3. Effect of set in order on employee performance. The value of the set in order coefficient of -0.082 indicates that if the assumption of the value of the other independent variables is fixed and the value of the variable set in order increases by 1 point, it will reduce the performance by 0.082. This means that set in order has a negative influence on employee performance. Partially set in order does not affect the performance of employees at PT Cameron Systems Batam. This is indicated by the results of research data where the results of sig 0.411 are obtained, then 0.411 > 0.05 and tcount -0.831 <ttable 2.017.

4. Effect of shine on employee performance. From the results of the multiple regression analysis table, it can be seen that the value of 0.909 is a constant value (a). The
value of the shine coefficient of -0.017 points indicates that if the assumption of the value of other independent variables is fixed and the value of the shine variable increases by 1 point, it will reduce the performance by 0.017. This means that shine has a negative influence on employee performance. Shine partially does not affect the performance of employees at PT Cameron Systems Batam. This is indicated by the results of research data where the results of sig 0.909 are obtained, then 0.909 > 0.05 and t_count -0.115 < t_table 2.017. The results of the tests that have been conducted relate to the previous research, namely the research conducted by Handayani (2017).

5. Effect of standardize on employee performance, From the results of the multiple regression analysis table, it can be seen that the value of 0.909 is a constant value (a). Standardize partially does not affect the performance of employees at PT Cameron Systems Batam. This is indicated by the results of research data where the results of sig 0.533 are obtained, then 0.533 > 0.05 and t_count 0.629 < t_table 2.017. The results of the tests that have been conducted relate to previous research, namely research conducted by Handayani (2017) where the effect of seiketsu (Standardize) on the performance of the t test results in sig 0.065, then 0.065 > 0.05 and t_count 1.868 < t_table 1.985, it can be concluded that seiketsu (Standardize) partially has no effect on employee performance.

6. Sustain influence on employee performance, from the results of the multiple regression analysis table, it can be seen that the value of 0.909 is a constant value (a). The sustain coefficient value of 0.699 indicates that if the assumption of the value of other independent variables remains and the value of the sustain variable increases by 1 point, it will increase the performance by 0.699. This means that sustain has a positive influence on employee performance. Sustain partially affects the performance of employees at PT Cameron Systems Batam. This is indicated by the data from the research where the results of sig 0.000 are obtained, then 0.000 < 0.05 and t_count 6.356 < t_table 2.017. The results of the tests that have been conducted relate to previous research, conducted by Handayani (2017) where the effect of shitsuke (Sustain) on the performance of the t test results in a value of 0.000, then 0.000 < 0.05 and t_count 4.612 < t_table 1.985 it can be concluded that shitsuke (Sustain) partially influences on employee performance.

7. The effect of safety, sort, set in order, shine, standardize and sustain on employee performance. Based on the results of the F test, it can be seen that the results of statistical calculations show the value of F_count = 25.743 with a significance degree of 0.000 < 0.05 and F_table 2.32. So that the value of F_count is 25.743 > F_table 2.32, simultaneously the variables of safety, sort, set in order, shine, standardize and sustain have an influence on employee performance.

V. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusion

Based on analysis and discussion on the effect of safety, sort, set in order, shine, standardize and sustain on the performance of PT Cameron Systems employees, conclusions can be drawn as follows:

1. Safety, sort, standardize and sustain have a positive effect on performance and there are no partial effect on the performance of employees of PT Cameron Systems.

2. Set in order and shine have a negative effect on performance and there are no partial effect on the performance of PT Cameron Systems employees. This is because employees have not been able to implement laid back activities in places that have been provided with items that have been used.

3. Safety, sort, set in order, shine, standardize and sustain simultaneously have an influence on employee performance.

B. Recommendations

To maximize safety at PT Cameron Systems, it is necessary to check each workstation by the HSE team regularly so that employees are always aware of safety at PT Cameron Systems, to maximize sort at PT Cameron Systems, it is necessary to re-layout or change the location of rack tools, red tag areas and trash cans that are closer so employees are not difficult in separating items that are still used and not used and, there is a need for awareness and discipline of each individual to carry out the activities of restoring the items that have been used. This will certainly be a motivation for other employees who use the workstation. To maximize the shine, it is necessary to have additional time at the end of the shift to carry out clean-up activities at each workstation, as well as a handover for the next shift. So that the next shift receives the workstation clean. Vice versa. To maximize standardization, there is a need to be strict procedures and regulations and sanctions to enforce the 6S function. With this, employees will be more obedient and obedient to applicable procedures and regulations. To maximize sustain, there is a need for cooperation from all employees to encourage and motivate each other in carrying out 6S activities. And the role of leaders and supervisors is needed as reminders and advisors on the importance of 6S. To maximize safety, sort, set in order, shine, standardize and sustain it takes the role and support of all employees. Start from operators, welder, leader, supervisor, and manager and blackbelt as internal auditors who oversee the 6S at PT Cameron Systems Batam.

C. Limitations

The few limitations found by researchers are: there are still other independent variables that influence employee performance. Such as: Internal factors (personal) and External Factors (environment). Researchers only limit research to the dependent variable, which is performance. There are still other binding variables that are influenced by the 6S, such as work safety and employee discipline.

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