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The Influence of Cluttering, Work Environment, and Implementation of the 5-S Methods on the Performance of Coal Mining Employees

Yulfani Akhmad Rizky [1], Khuzaini [1], Syahrial Shaddiq [2], Ihsan Noor [3], Muhammad Syahid [4]

¹Master of Management Study Program, University of Islam Kalimantan (UNISKA), Jalan Adhyaksa No. 2 Banjarmasin, South Kalimantan, Indonesia, ²Accounting Study Program, Economic and Business Faculty, Lambung Mangkurat University (ULM), Jalan Hasan Basri, Banjarmasin, South Kalimantan, Indonesia, ³Mining Engineering Study Program, Faculty of Engineering, Lambung Mangkurat University, Jalan Ahmad Yani KM 34, Banjarbaru, South Kalimantan, Indonesia, ⁴Purchasing Team, PT Jorong Barutama Greston, Coal Mining Operation in South Kalimantan, Indonesia

yulfaniakmadrizky@uniska-bjm.ac.id, khuzaini@uniska-bjm.ac.id,
syahrial.s@ulm.ac.id, syahid_m@banpuindo.co.id, ihsan.noor@ulm.ac.id

Abstract. The availability of goods and spare parts to support mining operations depends on how to manage the storage of these goods in the warehouse at the site. Warehouse management depends on the arrangement of goods placement. An excessive pile of items that are not well managed hurts the work environment. More goods stored in the warehouse with uncontrolled clutter conditions will disrupt employee working conditions then the impact of a failure in working order is interpreted. The 5-S concept implementation is a method of decluttering by S1 is *seiri* (concise), S2 is *seiton* (neat), S3 is *seiso* (clean), S4 is *seiketsu* (control), and S5 is *shitsuke* (diligent) to improve material handling in the store to have better condition of working environmental for better employee performance in the warehouse. As a journal review of the 5-S concept, can be summarized that the 5-S concept implementation in a mining operation organization has a positive significant effect on their working performance including time, and cost efficiency.

Keywords. Clutter, 5-S, working environment, employee performance

1. Introduction

The density of mining operations supported by the equipment availability forces us to prepare goods and spare parts to support equipment maintenance with a quick response at the site. At the operational location, a warehouse can be created as a mini shop that can prepare all the goods needed quickly. The goods that can be obtained increase the desire for handling equipment maintenance and stored in the site warehouse is good for repairing operational equipment which can have the impact of causing a lot of goods to pile up at the work site and risk-reducing employee performance due to ineffective handling.

The work environment is one of the factors that play an important role in overall employee performance. Performance is the result of work in terms of quality and quantity achieved by an employee in carrying out his duties according to the responsibilities given to him (Palšaitis et al., 2017). It is hoped that a conducive work environment can help form enthusiasm and a focused mind for employees. Several elements of the work environment, including lighting, air circulation, colour, cleanliness, good arrangement of goods, and security, will also influence employee performance, especially employees who manage the storage of goods in the clean warehouse. Avoid dirt, including dust, rubbish, and not good smelt. An unclean work environment will create a feeling of discomfort (KBBI, 2018; Zhenjing et al., 2022).

One of the basic causes of a messy or unclean work environment is an excessive quantity of items, such as dirt in the human digestive system, piles of items will cause toxic effects if not excreted immediately. Ironically, people often don't realize that owning items that were previously hoped to have a positive effect becomes a new problem for the people around them. The person responsible for handling goods in the warehouse will look for solutions so that there is no accumulation of goods and cleanliness is maintained. The Decluttering method is a method for dealing with the accumulation of goods that are not well arranged, where this method focuses on the efficient use and storage of these goods. Decluttering comes from the word clutter which refers to non-value-added items stored around us. Clutter must be handled well because clutter can cause stress in employees by increasing the hormone cortisol so that the brain interprets it as failure (Fauziah, 2018; Lukan et al., 2022).

Employees who are under pressure condition will experience a decrease in their thinking ability, which will affect their performance. The currently widely known decluttering method, 5-S, can become a work culture that influences employees' daily lives. A culture is a group of learned beliefs, values, and habits that direct the consumer behaviours of members of a particular society (Fransisca & Darmawan, 2018; Yap & Yazdanifard, 2014). Company culture will help employee group members to solve basic problems in hard survival, both in the external and internal environment, so that it can help group members in preventing uncertain situations. The problem-solving that has been found is then transferred to the next generation so that it will have continuity. Because it is considered powerful, Decluttering, a method mostly originating from Japan, has finally been adopted throughout the world, whether used for personal or corporate purposes (Suwondo, 2012).

2. Methods

The research methodology used is library research (qualitative descriptive) by collecting literature and conducting reviews from various relevant sources, including previous journals, books, and articles. The descriptive method can be interpreted as a problem-solving procedure that is investigated by describing the condition of the subject or object in research, which can be people, institutions, society, and others that are currently based on visible facts or what they are (Siedlecki, 2020)

3. Result and Discussion

3.1. Work Environment

The work environment greatly influences the management of goods, including incoming goods, placing goods, and picking up goods to support mining operations, especially in heavy equipment maintenance. The placement of goods and spare parts has an impact on the work environment, especially in warehouse locations at the site. The work environment can be

grouped into two, namely physical and non-physical work environments (Diputra & Suwandana, 2022). A physical work environment is defined as a set of physical factors and is a physical atmosphere that exists around employees (Nizar, 2013) while the non-physical work environment is all conditions that occur that are related to work relations, both vertical (superior-subordinate) and horizontal (colleague) relations (Diputra & Suwandana, 2022). Figure 1 shows the important relationship between superior to subordinate relations during big cleaning days as the 5-S implementation for cleaning the work area (Said et al., 2015).



Figure 1. Communication Activity from Superior to Sub-Ordinate (documentation)

The work environment can have both positive and negative impacts on employee performance. Working environments in the form of working conditions, equipment, and complete facilities simultaneously or together have affected the productivity of a company's employees, especially at mining locations which require active performance to support strict operations. Data obtained from survey questionnaire answers in a work environment shows significant results on employee performance (Said et al., 2015).

3.2. Cluttering

Cluttering is an important phenomenon that appears sometimes unexpected and unnoticed in our lives and is an important consideration in organizing goods in a warehouse. This can interfere with the search for an important item, for example, a spare part that is urgently needed, even though the item is small, must be replaced immediately so that the equipment can operate again. Clutter can interfere with making decisions quickly and correctly (Suwondo, 2012).

Cluttering is often not clearly understood as to its features, attributes, and related factors. How to identify it is a step that must be understood. In practical applications, computationally measuring clutter can help by optimizing the level of clutter on displays that we can control or by providing system alerts when clutter can interfere with task performance, for example, when clutter in a warehouse, goods and spare traffic become disrupted and has an impact on prepare the availability of equipment for operations well (Falck-Pedersen & Sonsterud, 2023)

Cluttering has a significant impact on lifestyle. Among the effects is stress, women are more easily stressed due to the large pile of things, while men tend to be less concerned about this, so disputes often occur within families or groups of employees. Like a domino effect, clutter will also automatically cause the environment to become dirty and unhealthy. The more stuff there is, the more difficult it is for you to keep it clean and well-organized. The more things are not organized, the more difficult it will be to find them, resulting in wasted time, energy, thoughts, and even money (Falck-Pedersen & Sonsterud, 2023);

If we examine the correlation relationship, it can be concluded that there is a hidden impact, namely an unexpected risk from the pile of things on the work desk. Clutter can disturb the ideal working environment, not only physically, but also non-physically. To create a good work environment, several things must be considered, including a spacious workspace, ventilation for air exchange, labelling of goods to make it easier to take, providing complete information on the position, and identity for ease of reaching them (Dao & Ferrari, 2020). The influence of the physical and non-physical work environment and work stress on employee performance. Most organizations found that employee performance increased in good environmental conditions, neatly arranged goods in the warehouse, and reduced employee stress levels because of the ease in managing incoming and outgoing goods (Dao & Ferrari, 2020).

3.3. Decluttering

Decluttering is a process towards a simple lifestyle by reduces material and non-material things that disturb an individual's focus so that it is easier to consume according to needs, manage finances, and create peace and happiness (Muster et al., 2022). The effects of decluttering to increase happiness in individuals who behave consumptive include 1) There is a significant change in happiness scores in people with a consumptive lifestyle after decluttering; 2) Several factors and impacts of consumer behaviours were found that are contrary to true happiness; 3) There is a decluttering effect on satisfaction, happiness, and optimism as well as several new understandings obtained by the subject such as the emergence of various positive emotions, optimal performance in carrying out activities, building positive relationships with the people around them, being more grateful, honing creativity, and other positive changes (Lukan et al., 2022).

Recently, there have been several popular ways to implement decluttering, including 5-S, Danshari, and KonMari methods, but from the characteristics of each method obtained from various available sources and articles, 5-S is the method most likely to be directly correlated with the work environment and employee performance. So far, the scope of application of Danshari and KonMari is more directed towards personal and housing. The following is a comparison of the characteristics of the three (Nikmah, 2018) as mentioned in Table 1.

Table 1. Decluttering Methods Comparison of 5-S, Danshari, and Konmari

Comparison	5-S	Danshari	KonMan
Basic Concepts	- <i>Seiri</i> (Sort) - <i>Seiton</i> (Straighten) - <i>Seiso</i> (Shine) - <i>Seiketsu</i> (Standardize) - Shitsuke (Self Discipline)	- No Unused Materials - No Piles of New Materials	- Category Sequentially - Useful & Spark Joy - Unused Materials

Scoping	Group / Organization	Individual / Family	Individual / Family
Standardized	Optimization	Spend as we Need	Useful & Spark Joy
Focusing	Unused Materials	Unused Materials	Stored Materials
Starting	Alternate	Random	One Solution

3.3.1. *Seiri, Seiton, Seiso, Seiketsu, and Shitsuke* of the 5-S Methods.

Learning from past experiences, the Japanese have created methods of continuous improvement. They have evaluated the ineffective materials handling. They failed the material management in the past. Kaizen's work culture introduced the 5-S methods as a key success in life. Kaizen means the improvement of a better life through continuous improvement methods. Kaizen does not require a large cost to implement because it starts from small steps, the most important thing is continuous effort and responsibility in its implementation. Kaizen explains how to organize a workplace, which is a comprehensive responsibility for all parts of the organization, from top management to employees with the lowest ranks. In the application of kaizen, there is a movement called 5-S meaning *Seiri* (sort), *Seiton* (straighten), *Seiso* (shine), *Seiketsu* (standardize), and *Shitsuke* (Self Discipline) (Nikmah, 2018).

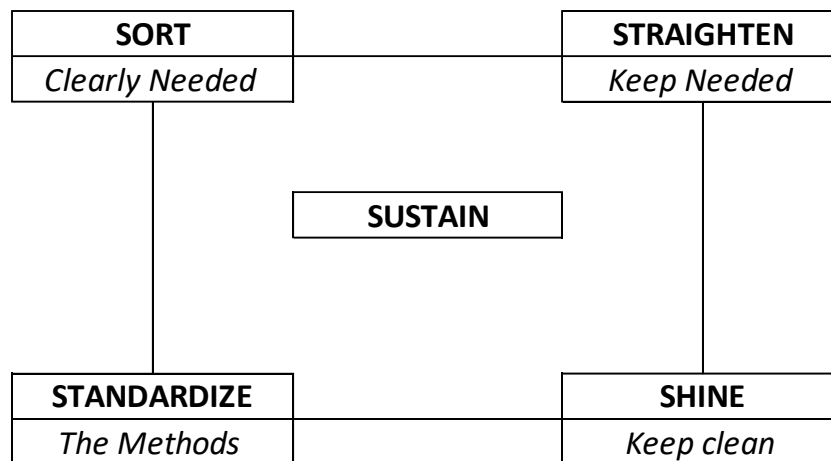


Figure 2. Schema of 5-S Methods for Decluttering Process

Seiri (sort) is a concept of grouping things around us. Existing goods are grouped into two groups, namely goods that are needed and those that are not. Items identified as unnecessary things will be removed from the work environment either removed or thrown away. Indicators of implementing *Seiri's* work culture are goods/equipment sorted and disposal of goods/equipment (Nikmah, 2018; Tahasin et al., 2021).

Seiton (straighten) is the concept of arranging goods/equipment in a better place. Items are arranged in functional storage to minimize time searching for items. Storage must also consider the quality and safety of goods. The indicators of *Seiton's* work culture are the arrangement of goods/equipment and the grouping of goods/equipment (Azzam et al., 2019; Nikmah, 2018; Tahasin et al., 2021).



Figure 3. Cleaning and re-arranging the materials. Left is before and right is after

Seiso (shine) is the concept of cleaning the work area and the items in it. Cleaning aims to be free from rubbish, dirt, and foreign objects. Indicators of this work culture include cleaning up trash and checking cleanliness (Azzam et al., 2019; Tahasin et al., 2021).



Figure 4. Stationery re-arrangement before condition (left) and after (right)

Seiketsu (treatment) is stabilization or maintenance that includes items and their environment. In this case, tagging, labeling, coding, and placement information are done. Indicators of this work culture are maintaining the workplace and fulfilling procedures (Azzam et al., 2019; Tahasin et al., 2021).



Figure 5. Clear Labelling will help to find the document in the filing system

Shitsuke (self-discipline) is a work discipline that has been implemented and has now become a habit for individuals in their respective work environments. Individuals must ensure that the previous steps are carried out well on an ongoing basis (Azzam et al., 2019; Tahasin et al., 2021).



Figure 6. Materials discipline arrangement at the warehouse for a better work environment

3.3.2. The 5-S Methods Improving the Employee Performance

The effect of implementing the 5-S method in coal mining activities has been proven in a study with the result that the 5-S method has an impact on employee performance. *Seiri* and *Shitsuke* are determined as independent variables and have a significant influence on employee performance, while the other three variables do not show a positive influence. *Seiri* and *Shitsuke* can provide positive results on employee performance because these two methods can provide good results in organizing goods. After all, new items must be arranged and those that have been arranged must be maintained. The other three things do not show real changes because the average employee already has good habits, so the effect of the changes is not real (Azzam et al., 2019). Figure 2 shows positive results in setting up a warehouse for mining activities, making it easier to search for spare parts more easily and quickly.



Figure 2. Spare Part replacement by 5-S implementation

A comparative study, compared to mining operations, such as restaurant employee management showed that the variables *Seiri*, *Seiton*, and *Shitsuke* have a significant impact on employee performance. In contrast, the variables *Seiso* and *Seiketsu* have no real effect. The results of research from an electronics factory show that the five variables of 5-S have a real influence on employee performance, this is an illustration that the 5-S method is very suitable for larger organizations and fast-moving materials management (Yudhanto & Purwanto, 2020)

Increasing employee performance can be measured using Key Performance Indicators (KPIs). Achieving work results exceeding predetermined targets is strongly supported by the implementation of the 5-S Method. Another fact is that the existence of standardized work procedures creates a more efficient work pattern, the time to complete a job is reduced because by doing the same work, we know which parts can be improved so that it becomes more concise and ultimately results in savings in terms of costs (Ahyadi et al., 2023; Purwoko et al., 2023).

Conclusion

Both individuals and organizations must start paying attention to cluttering considering it will have a domino effect on the work environment and performance. Cluttering shows failure in warehouse managing goods it can affect the condition of employees which has an impact on their work performance.

Considering the characteristics, the cluttering can be improved by the 5-S method compared with other decluttering methods. The 5-S methods are easier to apply for implementation. The implementation of 5-S methods in an organization has a positive impact on time efficiency and lower cost.

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