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Implementing an Addressing System to Optimize Employee Cycle Time Performance in the Logistics – Spare Parts Division of PT. Sanoh Indonesia

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A B S T R A C T
This study evaluates the effectiveness of the addressing system as an application of lean principles and visual management to optimize cycle time in the logistics – spare parts Division of PT. Sanoh Indonesia. The main issue was time waste during picking due to the lack of a visual navigation system. Using a case study approach with observation, interviews, and documentation, the addressing system (labeling, location coding, and zoning) significantly reduced time by 72.1% and improved work comfort, warehouse, organization, and new worker adaptation. These results reinforce operational management, lean, and warehouse management theories.

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INTRODUCTION

In today's modern era, the manufacturing industry is experiencing intense competition. This has driven producers, both manufacturing and service providers, to compete to operate efficiently. Efficiency refers to every process related to meeting consumer demand, including processing time and product distribution. Therefore, the primary focus is on the production process to ensure timely fulfillment of demand. This requires the ability to ensure efficient production.

Cycle time is a crucial metric for evaluating a company's operational performance. In today's competitive business landscape, understanding and managing cycle time is crucial to a company's success. By evaluating efficiency levels, identifying areas for improvement, and showcasing productivity, companies can optimize their operations, improve service quality, and remain competitive in the marketplace.

PT. Sanoh Indonesia, a manufacturing company in the automotive industry, faces challenges related to optimizing cycle times for greater efficiency, particularly in the logistics and spare parts division. Based on the author's experience during his internship in the logistics and spare parts division, the author identified issues related to cycle time optimization that can be addressed to increase the efficiency of the required processing time. The problem found at PT. Sanoh Indonesia in the logistics and spare parts division is the difficulty for employees in finding the location of production goods (picking) for packaging. This creates an obstacle or waste of time that needs to be managed properly for greater efficiency.

This research is highly relevant to the field of management, particularly in operational management and customer satisfaction. In an operational context, cycle time management plays a crucial role. overall lead time continuity. According to Taichi Ohno in A book by Jay Heizer, Barry.R, Chuck.M about lean operations, something that has no value in the eyes of consumers is waste. Where in the context of the problem at PT. Sanoh Indonesia, especially in the Logistics-Spareparts division, employees find it difficult to carry out the production process which results in unstable cycle time in employee performance. In previous research, it explains Lean Manufacturing Management which aims to increase the added value of work by eliminating waste and reducing unnecessary work and shortening lead times.

By considering relevant literature and observation results during the internship process, this paper aims to evaluate employee performance through optimizing cycle time in the work process, namely by implementing addressing which aims to simplify the employee work process as an effort to improve cycle time in the employee performance process.

This research is expected to provide tangible benefits for PT. Sanoh Indonesia in optimizing cycle time and employee performance, particularly in the Logistics and Spare Parts division. The objectives of this paper are:

1. To explore the efficiency of the ongoing work process through the implementation of an addressing system in the work environment as an effort to overcome the anxiety experienced by new employees and PKL

students regarding the work process.
2. Describes the impact of implementing an addressing system on the effectiveness of goods layout and the ease with which employees can search for goods in the storage warehouse.
3. To understand the influence and effectiveness of implementing an addressing system on increasing efficiency and comfort in work activities.

LITERATURE REVIEW

Operational Management

Operations management is a discipline that focuses on planning, organizing, directing, and controlling production processes and business operations to achieve efficiency, effectiveness, and predetermined business objectives. According to Heizer et al. (2020), operations management encompasses generating value in the form of goods and services by efficiently transforming inputs into outputs. This includes the efficient management of human resources, equipment, raw materials, and production processes to improve company performance. Operations management plays a crucial role in identifying and eliminating non-value-added activities, thereby accelerating production performance or cycle time. Operations management is the core of business processes related to the design, management, and control of goods and services production systems. According to Slack et al. (2022), operations management encompasses not only the technical aspects of transforming inputs into outputs but also plays a crucial role in creating added value through process efficiency, quality results, and the timeliness required to complete a process from start to finish. Good cycle time management can increase productivity, accelerate response to customer requests, and minimize waste in work processes.

Lean Manufacturing Management

Lean manufacturing is a production management approach that aims to increase process efficiency by eliminating all forms of waste without sacrificing productivity and quality. This concept originates from the Toyota system that focuses on creating maximum value for customers with minimal resources. According to Womack & Jones (1996) in a book entitled Lean Thinking, Lean is defined as "a way to do more and more with less and less human effort, less equipment, less time, and less space will come closer and closer to providing customers with exactly what they want." The five main principles of Lean are: determining customer value, mapping the value stream, creating a smooth process flow, using a pull system based on customer demand, and pursuing continuous improvement. One important method in implementing Lean principles is the 5S approach, namely Seiri (sorting), Seiketsu (standardization), Seiton (neat), Seiso (clean), Shitsuke (discipline). The 5S method aims to create a clean, orderly, and efficient workplace, thereby supporting productivity and reducing wasted time due to searching for goods or work tools. The implementation of 5S is closely related to the addressing system because the principles of Seiton and Seiketsu encourage systematic and consistent placement of goods. According to Hirano (1996), the implementation of 5S is not only about

physical cleanliness, but also creating a disciplined and efficiency-oriented work culture. With good 5S implementation, the addressing system can be optimized because each storage location can be given a clear identity, unnecessary items can be eliminated, and the work process becomes smoother.

Addressing System in Visual Management Application

According to Gamberini et al (2009), a visual tagging system can reduce searching time and movement waste, two types of time wastage that often occur in logistics and manufacturing processes. With a clear placement system, employees no longer need to spend time searching for the location of goods, so cycle time or workflow can be reduced. This supports the achievement of operational efficiency and stable work process output. The implementation of an addressing system is also closely related to the principle of visual management in Lean manufacturing, where information is presented visually so that it can be understood quickly without the need for lengthy verbal instructions. This system has been proven to improve self-management among workers, especially for new employees or interns, who are not yet familiar with the workplace environment. As stated by Singh & Sharma (2017), "the implementation of an effective addressing and labeling system can reduce time spent searching for goods, as well as improve the smoothness of operational workflow." In other words, proper addressing can encourage a smoother workflow and minimize misplacement of goods.

Warehouse Management System

A Warehouse Management System (WMS) is a system used to manage, control, and optimize warehouse operations, including storage, tracking, and retrieval of goods. WMS encompasses not only information technology-based systems but also fundamental principles of efficient storage location planning, structured workflows, and picking strategies. According to Frazelle (2002), effective warehouse design, including mapping of goods locations (slotting), has a direct impact on overall picking time and cycle time efficiency. Therefore, although not always involving digital systems, WMS principles remain relevant when applied manually through the implementation of an addressing system.

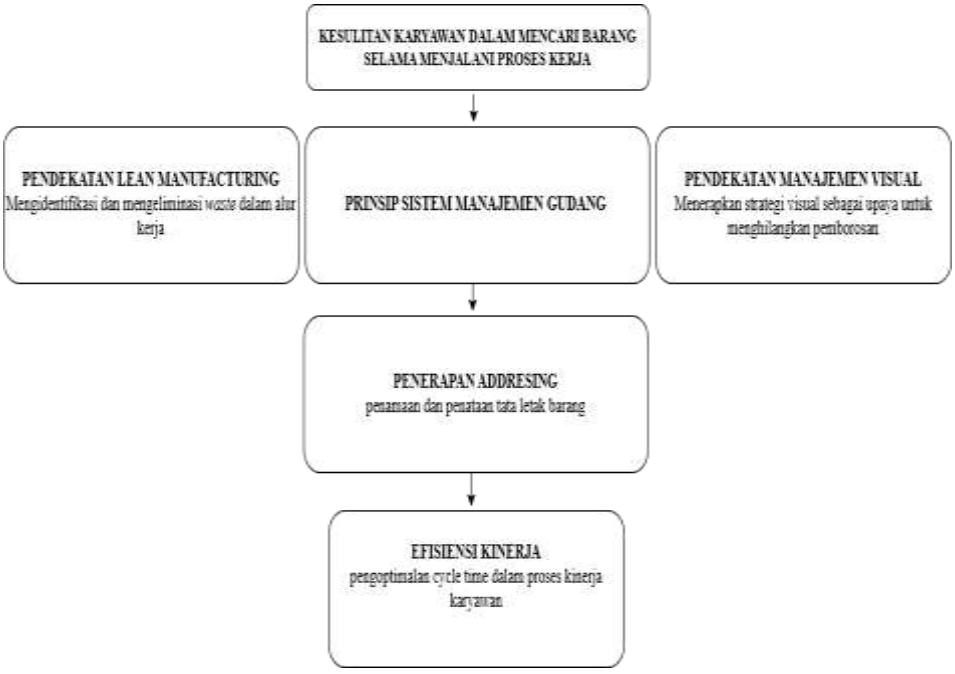

Figure 1. Research Framework
Source: author's data

METHODOLOGY

The author's approach in compiling this paper is to use a case study method (study case research), to explore in depth the phenomenon of addressing system implementation in the operational context of the spare parts logistics warehouse of PT. Sanoh Indonesia. The object of this paper is the application of the addressing system in the logistics work process at the spare parts logistics warehouse of PT. Sanoh Indonesia. The units analyzed in this paper are operational activities in searching and arranging goods, as well as the perceptions of new employees and PKL students towards the addressing system before and after implementation. Data collection techniques in this paper were carried out using several techniques aimed at obtaining accurate and relevant information regarding the condition of the spare parts logistics warehouse before and after the implementation of the addressing system. The techniques used include direct observation, semi-structured interviews, and documentation. These techniques were used to process data obtained from observations, interviews, and documentation conducted during the author's internship process in the Logistics-Spare Parts division of PT. Sanoh Indonesia. The collected data reflects real conditions in the field related to changes in goods searching and arranging activities after the addressing system was implemented.

RESEARCH RESULT ANDDISCUSSION

Interview Results

Employee and Student Perceptions of Internships

Based on interviews with several new employees and internship students, it was discovered that before the addressing system was implemented, they experienced difficulty identifying storage locations. The lack of shelf naming or

comprehensive location coding made the retrieval process inefficient and time-consuming. This also led to confusion and dependence on senior employees to inquire about the location of needed items.

One of the workers interviewed, Muhammad Rizal, a new employee from another division, expressed his perception regarding the implementation of this system:

"It helps, sir, because yesterday before it was arranged like this, I had to go around first and ask Mr. Fathur when I wanted to pick up the goods because the storage location was random and not all of the parts were arranged neatly, so it took a bit of time when a PO came in."

A similar perception was expressed by other workers, namely the internship students. They felt more confident in carrying out their tasks after the addressing system was implemented because all item locations were organized and clearly visually coded. Furthermore, the internship students admitted that Their adaptation was quicker because the system provided visual guidance that helped them identify shelves and storage bins based on specific zones. They no longer needed to rely on confusing verbal instructions, especially during busy work hours.

PiC Perception

From a managerial perspective, the perception given by the PiC (person in charge) or person in charge of the Logistics – Spareparts Division also shows that the implementation of the addressing system has a significant impact on the stability of working hours and the tidiness of the warehouse area.

Fathurrahman, one of the long-time employees and also the PiC in the preparation section, said that:

"Okay sir, for the after-implementation of this itself, it certainly helps us in our work, especially in the process of picking up goods which was a bit time-consuming yesterday, whether it was the wrong goods or the goods were hard to find, there were definitely obstacles yesterday, but after this implementation, the arrangement has become more organized, and we workers also feel comfortable because the storage layout is neat according to the type of part series, and of course we don't need to bother anymore after this is in place."

According to him, implementing this addressing system helps reduce errors in picking up goods, especially during urgent deliveries or large-scale packaging situations. He said that previously, he often... Errors occurred when picking similar items due to the lack of clear differentiation in storage locations. The PiC also explained that new employees no longer need to spend long periods of orientation because the visual system allows navigation to the item's location. This impacts the overall efficiency of the work process.

Interview Results Recapitulation

In order to provide a more systematic overview of the perceptions provided by employees in the Logistics – Spareparts Division of PT. Sanoh Indonesia, the following is a summary of the interview results conducted in the form of a thematic analysis:

Table 1. Interview Recapitulation Results

No	Source person	Question	Worker Response
1	Fathurrahman – Long-time employee and PiC preparation	How does the work process compare before and after the system was implemented? (changes in the work system)	*OK, sir, the after effects of this application itself are certainly very helpful for us in our work., especially in the process of picking up goods which did take a bit of time yesterday, whether it was the wrong goods or The items were hard to find, there were definitely obstacles yesterday, but after this was implemented, the arrangement became more organized, and we workers also felt comfortable because the storage layout was neat according to the type of part series, and we definitely didn't need to bother anymore after this was implemented.*
2	MuhammadRIZAL – new employees from other divisions	Does the addressing system help you find items? (system effectiveness)	*Help me, because yesterday before I arranged it like this, I had to go around first and ask Mas Fathur when I wanted to take the items because of the location. storage ThatIt is indeed random and not all of the parts are neatly arranged for each type, so it takes a bit of time when a PO comes in.*
3	Rayyan – PKL student in the Logistics-Spareparts division	Do you feel more comfortable working after the addressing system was implemented? (comfort at work)	*It's comfortable, bro, now it's delicious, you don't need to worry about taking the wrong item anymore, the part number is there, there are sample photos, the shelves are also clear so you don't have to bother looking for it now.*

Source: Author's Data

Cycle Time Analysis – Time
Time Comparison

After implementing addressing in an effort to optimize cycle time in employee performance, especially in the activity of picking goods in the Logistics Division - Spareparts PT. Sanoh Indonesia. It is known that there is a decrease in the time required to complete the activity based on calculations before and after the implementation. With the decrease in time resulting from the implementation of addressing, it states the alignment of information with statements that have been previously known from the results of interviews with respondents affected by this application. They stated that work activities became faster because the conditions of the work area were more organized. This calculation was carried

out using manual calculations using a stopwatch for three trials with different types of goods and was carried out directly while carrying out work activities, this aims to ensure the accuracy of the resulting data from all the resulting data. The resulting reduction data already includes aspects that occur in the activity, such as confusion experienced before the application and the process of picking goods on the storage rack. The reduction data is as follows:

Table 2. Results of Cycle Time Comparison in minutes

information	Before	After	Decline
First attempt	13 minutes 29 seconds	3 minutes 21 seconds	10 minutes 8 seconds
Second attempt	14 minutes 5 seconds	3 minutes 54 seconds	10 minutes 11 seconds
Third attempt	11 minutes 54 seconds	3 minutes 41 seconds	8 minutes 13 seconds

From the decline data above, the percentage decline from each experiment is: *Counting based on seconds:*

Table 3. Results of Cycle Time Comparison in Seconds

Information	Before	after	*Total decrease*
Experiment 1	809 seconds	201 seconds	***608 seconds***
Experiment 2	845 seconds	234 seconds	***611 seconds***
Experiment 3	714 seconds	221 seconds	***493 seconds***

Source: Author's Data

$$Calculation\ formula = \frac{waktu\ sebelum - waktu\ sesudah}{waktu\ sebelum}\ x\ 100$$

- Experiment 1
  $Decline = \frac{608}{809}$ x 100 = 75.16
- Experiment 2
  $Decline = \frac{611}{845}$ x 100 = 72.31
- Experiment 3
  $Decline = \frac{493}{714}$ x 100 = 69.06

Comparison Conclusion

From the comparison of the time before and after the implementation of the picking activity, it can be concluded that the implementation of addressing is able to optimize employee performance. Their work activities in terms of cycle time reduction. Data from three experiments showed a 72.1% reduction in average picking time. The calculation results are as follows:

$$= \frac{72.16 + 72.31 + 69.06}{3} = 72.18 = 72.1\%$$

The resulting reduction is not only visible from the quantitative aspect, but is also supported by the responses of employees and PKL students who stated that there was an increase in work comfort, a decrease in confusion in picking activities, and an increase in the overall orderliness of the work area. The application of addressing which includes labeling, location coding, and zoning has been proven to play a role in accelerating work processes, reducing waste, and reducing the potential for errors in the picking process. These results also support the principles of Lean Manufacturing, especially in the aspect of waste reduction and the application of the 5S concept (Seiri, Seiton, Seiketsu, Seiso, Shitsuke), as well as the concept of visual management and Warehouse Management System (WMS) in the context of logistics.

Data Interpretation

In analyzing the data obtained from the results of the observation, interview, and documentation processes during the internship in the Logistics – Sparepart Division of PT. Sanoh Indonesia, the author used the data analysis approach developed by Miles, Huberman, Saldana (2014), namely by carry out three stages, namely: data reduction, data presentation, and drawing conclusions.

Data Reduction

Data reduction is done by filtering and selecting relevant information from interviews, direct observations, and collected documentation. The main focus of this process is:

1. System effectiveness
2. Changes in work systems
3. Work comfort after implementation is done

Examples of filtered data are quotes from sources that directly state changes in work speed, or observations that indicate confusion. Before systemInformation that is general in nature or unrelated to the research objectives will be removed or not included.

Data Presentation

After data reduction, the next step is to organize and display it in narrative, visual, and tabular form, making it easier to understand and apply further. These displays include:

a. Comparison table of time (cycle time) before and after system implementation.
b. Documentation in the form of photos of the warehouse, labeling (shelves and boxes).
c. Quotes from sources from both old and new employees and PKL students explaining the direct impact of the implementation on their work activities.

This presentation provides a concrete picture of the differences in conditions before and after the system is implemented.

Conclusion Drawing and Verification

From the data presented, the author concludes that the addressing system has a significant positive impact on reducing picking time and increasing comfort and orderliness in the work process. This can be seen from:

a. The average time reduction was 72.1%, based on the results of calculations on three trials of picking time.
b. The source's statement stated that the work they do has become more structured, faster, and less confusing.

Verification Through Data Triangulation

To strengthen the validity of the findings, the author conducted data triangulation, namely a verification process by considering the results from three main data sources:

a. Direct observation of operational activities in the field before and after the system is implemented.
b. Semi-structured interviews with new, existing, and internship students.
c. Visual documentation and cycle time records as physical evidence of changes to work systems.

The three data sources provide consistent and mutually supportive results. Observation findings are supported by informant statements and reinforced by documentation demonstrating significant changes in the work area. Thus, this triangulation process confirms that the conclusions drawn are based on a comprehensive validation process, and not solely on the results of a single source.

Theoretical Relationship

To support the main finding that the addressing system can optimize cycle time and create a more efficient and comfortable work environment, the findings of this study indicate a close relationship with several theories that have been reviewed in the literature review, particularly in the scope of operational management, lean manufacturing, and management. visual, and warehouse management systems (WMS). By comparing empirical field findings with the theoretical framework, it can be seen that implementing an addressing system is not merely a practical solution, but also has a related theoretical basis.

Operational Management

In operational management, one of the key aspects is work process efficiency. This includes reducing cycle time, increasing productivity, and improving workflow. According to observations and time analysis, the implementation of an addressing system resulted in a 72.1% reduction in average picking time. This directly demonstrates the effectiveness of good process management, as stated by Heizer et al. (2020), who stated that efficient process management can increase added value for both the company and customers. Furthermore, Slack et al. (2022) state that operational management involves efforts to accelerate response to requests and maximize non-productive activities. In this context, the results of this study indicate that employees no longer need to waste time searching for

items manually without direction, thanks to the implementation of the addressing system.

Lean Manufacturing

The main focus of the Lean Manufacturing concept is on eliminating waste (wasted time) and increasing added value in every process. The results of this study are in line with this principle, where in actual conditions before implementation, it was identified that waste was caused by inefficient work processes. After the addressing system was implemented in the ongoing work process, the process became faster, neater, and more organized. This is in line with the 5S principles (seiri, seiton, seiketsu, seiso, shitsuke), especially in Seiri (sorting), Seiton (arranging), Seiketsu (standardization). Which aims to create an efficient and easily understood workplace. According to Womack & Jones (1996), lean is not just a production method, but a philosophy that emphasizes continuous improvement by minimizing waste in the form of time, movement, and errors. Through the implementation of addressing, the picking process which was previously prone to errors became faster and more accurate, reflecting the success of lean principles applied in actual phenomena.

Visual Management & Addressing System

The implementation of the addressing system in the Logistics and Spare Parts Division of PT. Sanoh Indonesia is a concrete example of visual management. It aims to simplify information into easy-to-understand visuals. Through the use of large labels, location codes, and With a systematic shelf structure, employees can easily identify the location of items without the need for verbal instructions or extensive work experience. This supports Singh & Sharma's (2017) statement that an effective visual system can reduce search time and improve the smoothness of work processes. Furthermore, Gamberini et al. (2009) stated that the use of a visual marking system in a warehouse environment can reduce searching time and movement waste. In the actual context, after implementation, the success of visual management in practice is directly proven.

Warehouse Management System (WMS)

Although the addressing system implemented in the Logistics – Spareparts Division of PT. Sanoh Indonesia is still manual, its structure and logic align with the principles of a Warehouse Management System (WMS). In a WMS, systematic location mapping (slotting), clear marking, and standardized flow are essential. This is evident in the implementation of shelf zoning, placement according to picking, and box labeling. This aligns with Frazelle's (2002) opinion, which states that an efficient storage system plays a crucial role in accelerating retrieval times. Furthermore, Baker & Canessa (2009) also stated that a good warehouse design must be equipped with an intuitive visual system and location navigation to support quick decision-making in the field. The implementation of the addressing system conducted in this study proves that even a simple approach can reflect modern principles in warehouse management.

CONCLUSION

The overall objective of this research is to optimize cycle time in employee performance, particularly in the picking process in the Logistics and Spare Parts division, through the implementation of a visual management system in the form of an addressing system. Based on the results of data collection, including observation, interviews, documentation, and data analysis, the following conclusions can be drawn:

a. The implementation of a zoning and labeling-based addressing system has been proven to significantly reduce item search time (cycle time). The average reduction reached 72.1%, based on three trials of item searches before and after the system was implemented. This demonstrates that the addressing system has a direct impact on work efficiency.
b. New employees and internship students experienced increased job satisfaction and increased confidence in performing their work activities. Prior to the system's implementation, work processes relied on the verbal knowledge and experience of existing employees. Once implemented, employees can work more quickly and easily without relying on these resources.
c. The work environment becomes more structured, clean, and visually organized. The addressing system allows for consistent placement of items based on category, size, and frequency of retrieval. This supports a streamlined workflow that is easy for employees to understand.
d. Field findings align with theories of Operational Management, Lean Manufacturing, and Visual Management. The implementation of an addressing system supports the principles of waste reduction, increased efficiency, and the creation of a work system with minimal personal dependency.

Thus, this study proves that a simple solution such as addressing can have a big impact on work efficiency, especially in the context of a medium-scale warehouse or logistics area.

RECOMMENDATION

Based on a review of the research results and implementation of the addressing system carried out during the internship, the author provides several strategic recommendations as follows:

a. The implementation of the addressing system should be adopted as an official Standard Operating Procedure (SOP) in the Logistics and Spare Parts Division of PT. Sanoh Indonesia. This way, the system will not be merely temporary but will become a permanent part of the company's work culture.
b. Companies are advised to create a short guide (Visual SOP) regarding the addressing system, including location maps, shelf codes, and visual work instructions. This will help new employees and current and future internship students adapt more quickly.
c. The addressing system can be further developed by utilizing simple technologies, such as barcode scanning or spreadsheet- or app-based

digital locators. This will improve data accuracy and flexibility in stock management.

d. This addressing implementation method can be adopted by other departments or divisions experiencing similar real-world events, such as raw materials warehouses, production departments, or finished goods logistics. The basic principles of addressing can be adapted to individual needs.

ADVANCED RESEARCH

For further research, it is recommended to measure the long-term impact of implementing addressing, including in relation to work quality, retrieval accuracy, and employee satisfaction with the visual work system.

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