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Implementation of 5R Culture to Achieve Total Quality Management (TQM) at PT Aneka Dharma Persada

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Abstract – The concept of 'quality' is becoming increasingly recognized across industrial sectors, as evidenced by the emergence of methodologies such as TQM, Kaizen, and Quality Circles. The 5R (Reduced, Refined, Radiant, Retain, Reliable) program, which includes Sort, Set in Order, Shine, Standardize, and Sustain, has become an essential component in enhancing efficiency and quality management within a company. This study aims to evaluate the effectiveness of the 5R program implementation on the achievement of Total Quality Management (TQM). The method of this study is a descriptive approach using a case study design and mixed methods, integrating both qualitative (field observations and interviews) and quantitative data (audit scores and monthly performance metrics). This combination enables a comprehensive evaluation of the 5R program. Data were collected through field observations, in-depth interviews, analysis of audit results, and monthly performance scores from ten work areas. Manufacturing company PT ADP, as a case study, was employed to examine the benefits of the 5R implementation in relation to TQM standards. The findings contribute to practical knowledge by demonstrating that structured implementation of 5R can significantly support Total Quality Management (TQM) in manufacturing settings, particularly in enhancing productivity, discipline, and operational efficiency. The results indicate that the 5R program can support the foundation of TQM by ensuring higher work efficiency, reduced waste, and a more disciplined and responsible work ethic. The 5R culture is essential in supporting the implementation of TQM to improve quality and innovation for sustainable growth, competitiveness, adaptability, and customer satisfaction.

Keywords: 5R culture; Quality; Total Quality Management; TQM; Kaizen; 5R

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1. Introduction

Each industrial sector organization is becoming aware of the concept of 'quality' which has entered the construction industry with its concepts such as TQM, Kaizen, Quality Circles, etc. The rapid advancement of technology has brought significant progress to the industrial sector. Industries require high-quality human resources to maintain standards since they are a crucial and dominant component of any organization. Therefore, human resources must possess the necessary skills to complete tasks that align with the organization's objectives. Establishing a strong work culture is one of the key strategies to develop high-quality human resources. One widely adopted work principle in the industrial sector is the 5R methodology (Reduced, Refined, Radiant, Retain, Reliable) or in Indonesia, it called "Ringkas, Rapi, Resik, Rawat, Rajin" [1]. This concept is similar as the 5S concept in kaizen, where 5S consists of seiri, seiton, seiso, seiketsu, and shitsuke [2]. This principle is a structured approach to organizing the workplace to enhance worker effectiveness and efficiency.

The 5R culture offers numerous benefits, such as maintaining a clean and organized workspace, facilitating waste identification, improving productivity and efficiency, reducing product defects, and strengthening corporate image. The adoption of 5R in various Indonesian companies, including in the manufacturing and food industries, has proven effective in enhancing reputation and customer trust, particularly through its focus on product quality and cleanliness [3].

The implementation of 5R helps companies and institutions manage workspace, human resources, time, quality, and capital more efficiently, thereby reducing product failures and fostering a clean, well-organized, and disciplined work environment [4]. several companies engaged in construction have proven to have implemented TQM [5], [6]. TQM (Total Quality Management) is a company-oriented approach that ensures all organizational activities are aligned with customer needs and

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expectations[7]. Implementing TQM enables companies to remain competitive in an increasingly intense market. TQM involves organizational transformation, including structural changes, goal-setting adjustments, and the redefinition of managerial and employee roles. The application of TQM in organizations positively impacts work characteristics and significantly enhances both manufacturing and service quality within companies [8].

Active participation from all employees is also essential. Employees must recognize their responsibility for maintaining workplace cleanliness and orderliness. Training programs on 5R should be incorporated into corporate culture and daily routines to instill its significance and positive impact [9]. To ensure successful and effective implementation, regular monitoring and evaluation of the 5R program are necessary. Management must conduct frequent workplace inspections, provide feedback to employees, and engage in long-term improvement strategies [10]. Additionally, acknowledging and rewarding employees who contribute to the 5R implementation can serve as an additional motivational factor.

An effectively implemented 5R culture minimizes the risk of workplace accidents, damage, high costs, and product defects. A clean, organized, and safe work environment allows employees to perform better and produce high-quality products [11], [12]. However, companies may face challenges in implementing 5R if the process is not well-executed. Therefore, achieving effective and sustainable implementation of 5R requires strong commitment and participation from all stakeholders.

As a manufacturing company, PT Aneka Dharma Persada (PT ADP) prioritizes production effectiveness, efficiency, productivity, and workplace safety to meet corporate standards. Implementing the 5R program among employees is crucial for creating a safe and comfortable work environment, aiming to minimize performance decline, reduce productivity, lack of accuracy, waste time, and workplace accidents. To foster a 5R culture, management must lead by example by prioritizing cleanliness and organization in the workplace [13]. They must provide support, resources, and necessary tools to facilitate the effective adoption of 5R [10].

This study aims to evaluate the implementation of the 5R program at PT ADP, focusing on its impact on operational efficiency, waste reduction, and quality improvement in supporting TQM.

2. Method

This study employs a mixed methods approach, combining qualitative and quantitative data to provide a comprehensive understanding of the 5R culture implementation. Qualitative data were obtained through direct field observations and in-depth interviews with practitioners, while quantitative data was sourced from audit result scores and monthly performance metrics across ten work areas at PT ADP.

This methodological triangulation ensures not only rich contextual insights but also measurable performance indicators that reflect the impact of the 5R program on workplace discipline and productivity.

The researcher conducts direct observations and identification, as well as in-depth interviews with field practitioners to obtain the necessary information and data about the subject being studied and clarify any unclear aspects. The collected data provides an overview of how 5R culture is implemented at PT ADP. For the qualitative data, the interview transcripts were analyzed by identifying recurring patterns and classifying responses into categories based on 5R principles. This helped reveal employee perspectives, challenges, and behavioral patterns related to 5R implementation and its alignment with TQM goals

3. Theoretical Framework

3.1. Total Quality Management (TQM)

The concept of quality is frequently associated with several key factors. The factors that have been identified as contributing to this phenomenon include the seeking of excellence, the understanding of customer needs, the taking of action to earn customer respect, the demonstration of leadership, the involvement of all individuals, the fostering of team spirit to achieve common goals, and the use of benchmarks to measure progress [12]. TQM is a management approach focused on improving overall quality in every aspect of an organization [7]. TQM aims to enhance customer satisfaction through greater employee engagement, continuous process improvement, and data-driven decision-making [14].

Key Principles of Quality Management [15]:

1. Customer Focus
   Organizations must prioritize meeting customer needs and expectations. Long-term success is achieved by attracting and retaining customer trust. Every customer interaction presents an opportunity to add value.
2. Leadership
   Enhance efficiency and effectiveness in achieving quality goals. Improves coordination across organizational processes—Aligns strategies, policies, and resources to achieve objectives.
3. People Engagement
   Effective management involves all individuals at every level. Recognition, empowerment, and skill development encourage contribution to quality goals.
4. Process Approach
   A quality management system consists of interrelated processes. Understanding how these processes work helps optimize system

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performance.

5. Continuous Improvement
   Essential for maintaining current performance levels. Prepares the organization for internal and external changes to seize new opportunities.
6. Evidence-Based Decision Making
   Decision-making can be complex and involve uncertainties. Understanding cause-and-effect relationships is critical to avoiding unintended consequences.
7. Relationship Management
   Stakeholders influence organizational performance. Managing relationships with suppliers and partners optimizes performance.

Four Levels of TQM Implementation [16]:

1. Quality Planning
   Establishing standards and procedures to ensure that products or services meet customer expectations.
2. Quality Control
   Monitoring and measuring product or service quality against set standards, conducting ongoing evaluations to correct deviations.
3. Quality Assurance
   Systematic processes to ensure that products and services comply with specified standards.
4. Quality Improvement
   Gradual and continuous enhancement in all operational aspects. Improving process efficiency and product quality.

TQM represented the fourth phase of evolution, highlighting a coherent and unified vision, comprehensive staff training, exceptional customer relations, and continual enhancement. TQM embodies an integrated approach that ensures that all levels of a structure are continually improving and 'Kaizen'.[2], [7], [17], [18]

3.2. The 5R Culture

The Kaizen concept, derived from the Japanese term for "continuous improvement", is characterized by the 5S method (Seiri, Seiton, Seiso, Seiketsu, Shitsuke). This method is employed to ensure the maintenance of a safe and comfortable work environment. The concept of 5R/5S bears a close relationship to the endeavours aimed at establishing a secure and comfortable work environment. The implementation of the 5R work principles is intended to engender a work environment that is uncluttered, aesthetically pleasing, secure and agreeable [2], [7]. In addition, 5R is a core Lean method to make workflow efficient. It is about keeping the workplace organized, clean, safe and productive. 5S is a way of thinking to see and eliminate waste. It is called 5S because each word starts with "S" (Sort, Straighten, Shine, Standardize, Sustain) [12], [19]. The implementation of the 5R programme constitutes a component of TQM, a system that has been demonstrated to engender a conducive work environment and exert a positive influence on employee productivity[1], [2], [12], [16].

The 5R Culture is a management concept aimed at creating a more efficient, productive, clean, and safe workplace by applying five key principles that are widely used in the industrial and business sectors. The implementation of the 5R work culture is regulated under Law UU No. 14 of 1970. 5R culture serves as a method to manage the workplace and enhance productivity properly. Proper and consistent implementation of 5R will create a clean and well-organized work environment.

Based on the reviewed PT ADP documents, the objectives of the 5R culture are as follows:

1. Reduce/Sein/Sort/Ringkas
   Determine what is needed and remove everything else.
   a. Creating a more spacious workspace.
   b. Establishing a comfortable work environment.
2. Refined/Seiton/Straighten/Rapi
   Set in order, a place for everything and keep it there.
   a. Organizing the workplace neatly.
   b. Ensuring an efficient layout and placement.
   c. Improving productivity by eliminating time wasted searching for items.
3. Radiant/Seiso/Shine/Resik
   Clean and keep it clean, all the time.
   a. A clean workplace ensures comfort and safety.
   b. Enhancing visual detection of potential damage to tools, machines, and the work area.
   c. Cleanliness supports better work quality and product standards.
4. Retain/Seiketsuu/Standardize/Rawat
   Create standard ways to stay organized
   a. Maintaining workplace order consistently.
   b. Sustaining cleanliness to improve work and product quality.
5. Reliable /Shitsuke/Sustain/Rajin

Self-discipline to keep it going.

   a. Incorporating 5R habits into daily work activities.
   b. Developing a positive mindset among employees regarding 5R.

4. Analysis and Discussion

PT ADP, there has been an increase in awareness of the 5R culture in the production area, one of which is achieved through monthly 5R audits. These audits help assess the awareness level of field operators in consistently implementing the 5R culture. Data from observations regarding audit area distribution and monthly percentage scores for each area can be seen in Table 1.

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Table 1.

5R Audit Area Distribution

Area	Location Name
I	Mold and Material Warehouse
II	*Stok yard*
III	Drainage Casting Area
IV	Reinforcement Area
V	Girder Production Area
VI	Workshop maintenance
VII	Building I (CCSP Production)
VIII	Building II (FPSP Production)
IX	Logistics
X	Reinforcement Room

Based on the observations that have been made this audit activity is carried out in the ready mix and hot mix areas of PT ADP together with the person in charge of each area in implementing 5R in their workplace. The subsequent illustration depicts the audit activities that have been executed in 10 distinct work areas, delineated as follows;

Figure 1. Assessment audit in the batching plant area, i.e. operator room and silo.

Figure 2. Assessment audit in the temporary storage area (TPS).

Figure 3. Assessment audit in the *stockpile area.*

Figure 4. Assessment audit in the sewage basin area.

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Figure 5. Assessment audit in the asphalt mixing plant (AMP) area, namely the cold bin and the environment around AMP.

Figure 6. Assessment audit in the asphalt mixing plant (AMP) area, namely the operator's room and asphalt tank area.

This assessment is significant to the company, as it enables the organization to maintain oversight of the updates and progress made by those in charge. This is imperative for the company to ensure the continuity of the 5R programme and to facilitate effective coordination with colleagues.

The results of the audit, conducted over seven months, are presented in Table 2 below.

Table 2.

Percentage Score Results for All Areas Each Month

Area	Month						
	March	April	May	June	July	August	September
I	28%	29%	10%	10%	0%	50%	54%
II	35%	40%	33%	44%	57%	39%	35%
III	39%	48%	44%	83%	59%	46%	69%
IV	42%	43%	52%	83%	73%	57%	58%
V	35%	42%	15%	31%	57%	49%	40%
VI	41%	10%	19%	0%	60%	47%	58%
VII	33%	45%	40%	67%	60%	0%	13%
VIII	63%	0%	15%	81%	0%	0%	63%
IX	0%	0%	35%	77%	0%	0%	94%
X	0%	0%	42%	23%	0%	0%	94%
Average	36,13%	36,43%	30,42%	50%	36,50%	28,79%	57,71%

The assessment by the auditor is conducted using a recapitulation of the 5R assessment, which comprises three assessment categories. Areas that have not implemented the 5R culture receive a score of 0, areas where the implementation of the 5R culture has not been maximized receive a score of 5, and areas that have maximized the implementation of the 5R culture receive a score of 10. The score is then converted into percent units. In the case of areas where the 5R culture has not been implemented, a score of 0% is assigned. Scores increase according to the level of implementation, up to a maximum of 100%. The overall results are illustrated in Figure 7 below:

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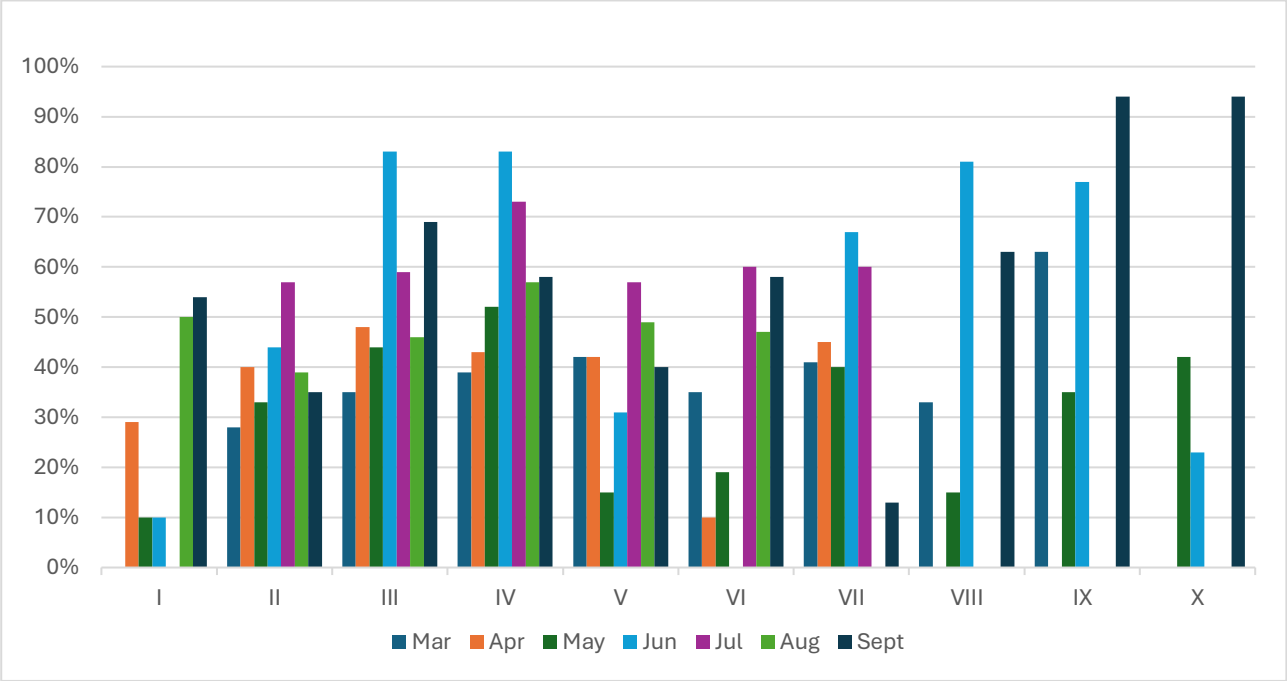

Figure 7. Percentage Score Results for All Areas Each Month

As illustrated in Figure 7 above, the mean score in each area can be observed. Another illustration can be seen in Figure 8, an additional illustration is provided, showing the mean score for all areas across each month.

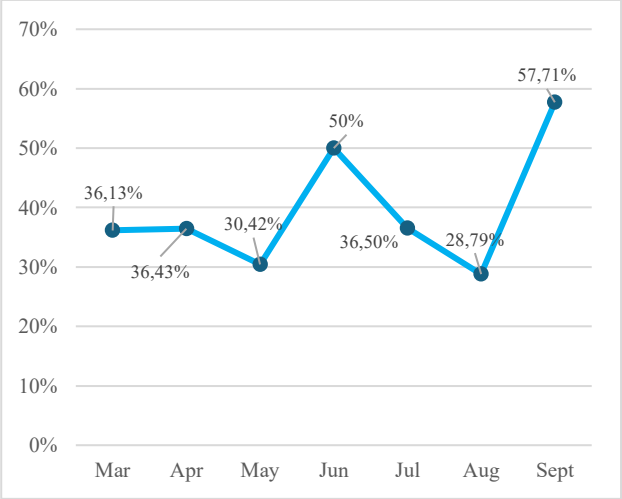

Figure 8. Recapitulation of Average Percentage Scores per Month

Table 2, Figure 7, and Figure 8 display the fluctuation of 5R culture implementation scores across ten production areas at PT ADP from March to September. Overall, the average score showed a significant increase from 36.13% (March) to 57.71% (September), although it dropped sharply to 28.79% in August. The production surge in August was several issues arose, including:

1. An increase in production waste,
2. Misplacement of production materials,
3. Other factors contributing to a drop in the average score in August.

However, after evaluations and corrective actions were implemented, the average score nearly doubled by September, demonstrating the effectiveness of the company's improvement measures.

Among the ten areas assessed, Area IX (Logistics) and Area X (Reinforcement Room) achieved the highest scores, reaching 94% in September. This reflects the success of these areas in maintaining cleanliness, orderliness, and discipline in line with 5R principles. Field observations and interviews with supervisors revealed that this achievement was supported by several qualitative factors. In Area IX, logistics personnel implemented a structured material labeling system and adopted a first-in-first-out (FIFO) approach, reducing clutter and ensuring efficient material flow. Meanwhile, in Area X, reinforcement workers demonstrated high adherence to standardized work procedures, supported by regular internal inspections initiated by area coordinators. Furthermore, both areas benefited from proactive leadership, where supervisors consistently monitored compliance and provided immediate feedback, which cultivated a strong sense of discipline and ownership among staff. These practices contributed to the successful and sustained implementation of 5R principles in both areas. On the other hand, Area I (Mold and Material Warehouse) consistently ranked the lowest, scoring 0% in July and 10% in several other months. These low scores indicate serious issues in organization and employee commitment, necessitating more intensive interventions such as additional training or resource allocation.

Monthly score fluctuations also reveal a strong

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correlation between production workload and 5R/5S implementation. For example, Area VIII (Building II) and Area IX recorded scores of 0% during certain months, particularly when production peaked. This underscores how, without strong oversight and commitment, 5R practices can easily be overlooked during operational pressures. However, the score recovery in September proves that the 5R culture can be reinstated through regular audits, evaluations, and continuous improvements. Overall, the data in Table 3 suggests that the success of 5R implementation hinges on three key factors: consistent management oversight, employee awareness and discipline, and proper resource allocation during production surges. PT ADP's achievement in raising the average score to 57.71% by September is commendable, though challenges such as employee resistance and a lack of in-depth understanding of 5R still require attention. By addressing these issues, the company can ensure that the 5R culture not only enhances productivity but also supports the broader goals of TQM). This result shows that the performance line has improved [11].

Knowledge necessitates an attitude that leads to action. Furthermore, the work environment is reflected in the attitudes and behaviors of employees. The company indicates that changes in employee attitudes and behaviors may result from changes in the work environment, influenced by their participation in the 5R program [20].

4.1. Challenges in 5R Implementation in the Production Area

Based on observational findings, deficiencies in the implementation of 5R were identified in a specific area, prompting discussions with relevant stakeholders to address the challenges and improve adherence. Several obstacles to the 5R program implementation include:

1. High market demand for precast products in August, leading to continuous production.
2. Lack of management commitment, resulting in ineffective execution.
3. Employee resistance to change.
4. Insufficient understanding and training for employees on the 5R program.
5. Limited resource allocation, affecting the optimal execution of 5R culture.
6. Lack of supervision and evaluation after the field audit.

The lack of top management commitment, low customer/client satisfaction, insufficient education on Total Quality Management (TQM), and an ineffective organizational quality culture have emerged as significant barriers to the successful implementation of TQM.

4.2. 5R/5S Implementation for Supporting TQM

The implementation of 5R plays a crucial role in supporting TQM, particularly in terms of time efficiency and quality improvement. The 5R principles contribute to maintaining a clean, organized, and comfortable workplace, allowing employees to enhance their work quality for maximum production outcomes.

PT ADP continuously improves its systems, including 5R implementation, to support TQM execution. The company innovates and evaluates past issues to prevent recurrences, ensuring continuous quality improvement. As a result, PT. ADP has reached Level 4 in the TQM system, signifying a commitment to continuous quality enhancement and customer satisfaction with its products.

5. Conclusion

After collecting data through interviews and field observations using a qualitative method regarding the implementation of the 5R culture to support TQM implementation at PT ADP, the conclusion can be drawn that 5R culture serves as a foundation for organizing the workplace, which impacts work culture, work effectiveness, and productivity efficiency, ultimately leading to high-quality production.

Based on the obtained data, the highest-scoring areas were Area IX (Logistics) and Area X (Reinforcement Room), both achieving 94% in September. The company contributed to a significant increase in the average score percentage from 28.79% in August to 57.71% in September. TQM combines quality and innovation for sustainable growth and competitive advantage, enabling companies to adapt quickly, satisfy customers, and outpace competitors.

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