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Application of RACI Framework for optimization of Key Performance Indicators (KPI) in manufacturing companies

I Made Sondra Wijaya[1], M. Ansyar Bora[2], Ririt Dwiputri Permatasari[3], Melda Andhini Fhasya Zulkarnaian[4]
[1]Engineering Management Study Program, Faculty Of Industrial Technology, Batam Institute Of Technology, Batam, Indonesia, desondra@iteba.ac.id
[2]Engineering Management Study Program, Faculty Of Industrial Technology, Batam Institute Of Technology, Batam, Indonesia, ansyar@iteba.ac.id
[3]Information Systems Studies Program, Faculty Of Information Technology, Batam Institute Of Technology, Batam, Indonesia, ririt@iteba.ac.id
[4]Engineering Management Study Program, Faculty Of Industrial Technology, Batam Institute Of Technology, Batam, Indonesia, meldaandhini2@gmail.com

Corresponding Author: ansyar@iteba.ac.id[2]

Abstract: This study successfully formulates effective Key Performance Indicators (KPIs) for measuring company performance using the RACI framework at PT XYZ Batam. The RACI framework, which identifies roles and responsibilities as Responsible, Accountable, Consulted, and Informed, is applied to ensure that each performance measurement aspect receives appropriate and accurate assessment. This research covers the identification of relevant KPIs in three key areas: work discipline, Occupational Health and Safety (OHS), and work environment. Through surveys and interviews with company stakeholders, the selected KPIs are then correlated with RACI roles to determine the weight of each role's contribution to achieving the KPIs. The results indicate that the application of the RACI framework enhances accountability and collaboration between departments, as well as facilitates more effective performance monitoring and evaluation. The RACI and KPI weighting matrix produced by this study provides clear guidance for PT XYZ Batam in managing the company's performance holistically and systematically.

Keyword: KPI, RACI Framework, Manufacturing Company

INTRODUCTION

Manufacturing companies face increasingly complex challenges in an era of globalization and intense industrial competition. In the midst of digital transformation and the need to improve operational efficiency, manufacturing companies must be able to effectively manage and measure performance (Luhgiatno et al., 2024). One widely implemented way to monitor and improve performance is to use Key Performance Indicators (KPIs) (Gouw et al., 2023) (Muhammad Aditya et al., 2024) (Fatrias et al., 2017) (Bora et al., 2020). KPIs enable companies to measure achievement against set goals, monitor operational results, and assess the efficiency and effectiveness of implemented strategies (Sudaryanto, 2024) (Damayanti et

al., 2023) (Yuniar et al., 2024). However, although KPIs have been widely accepted as an effective performance measurement tool, many manufacturing companies still face challenges in formulating and implementing them optimally.

According to Kaplan and Norton (1996), in his book entitled 'The Balanced Scorecard: Translating Strategy into Action', (Panjaitan et al., 2023) KPIs serve as an important tool for assessing long-term performance by utilizing measurable data, which can describe a variety of critical aspects of a business, from finance to internal processes. Although KPIs provide an overview of performance, they often do not describe in detail the clear distribution of responsibilities in achieving these goals (Warella et al., 2021). This is where the role of the RACI (Responsible, Accountable, Consulted, Informed) framework becomes very relevant (Pamungkas & Prasetyo, 2022). RACI Framework, which was first introduced by Andi G. D, helps define the roles and responsibilities of each individual in the organization, thus ensuring that the achievement of KPIs can be optimized in a structured and clear manner (Essy Malays Sari Sakti et al., 2024).

The use of RACI in the context of KPIs allows companies to clearly establish who is Responsible for carrying out activities, who needs to give final approval (Accountable), who needs to be Consulted for input, and who only needs to be informed about the decision (Putri & Prasetyo, 2022). This becomes important in increasing accountability and collaboration between departments. For example, in a study by (Sudaryanto, 2024), found that without a clear division of responsibilities, KPI implementation tends to fail to achieve the desired target. Therefore, integration between KPIs and racis can improve communication, collaboration, and alignment of strategies between different teams.

Although the application of the RACI framework has been used in various sectors, its application in the context of the manufacturing industry in Indonesia, especially in formulating and implementing KPIs, is still limited. Although many manufacturing companies in Indonesia use KPIs to monitor performance, there are still many who have difficulty in integrating KPIs with individual responsibilities effectively (Wahyudiono et al., 2019). This leads to a lack of transparency in the distribution of roles and responsibility for the achievement of targets, which in turn affects the overall operational performance of the company.

PT XYZ Batam, a manufacturing company in Indonesia, is a relevant example in this regard. Although the company has implemented KPIs to measure various aspects of operational performance, such as production efficiency, product defect rate, and production cycle time, there are problems in terms of accountability and unclear division of tasks between departments. This creates the potential for conflict, mismatches in achieving targets, and difficulty in ensuring that all individuals understand each other's role in achieving company goals. One of the main challenges faced is how to clearly define who is responsible for achieving each KPI, as well as how to ensure better coordination between different teams (Hersusetiyati et al., 2024).

This study aims to fill this gap by examining the application of the RACI framework in formulating and implementing KPIs at PT XYZ Batam. By integrating these two concepts, this study aims to improve the effectiveness of managing corporate performance, reduce the potential for role conflicts, and increase accountability. In addition, the study will also explore how the use of KPIs supported by RACI can improve operational efficiency in manufacturing companies, which is a major challenge in this highly competitive industry. Therefore, developing a robust KPI system, supported by a clear division of responsibilities, will be key in ensuring that manufacturing companies can operate efficiently and effectively (Fitriana et al., 2024). This research will focus on how to implement the right KPI and effective RACI framework at PT XYZ Batam, as well as measuring its impact on company performance.

This research is also highly relevant to the broader context, especially within the Indonesian manufacturing sector, which is constantly striving to improve its competitiveness and operational sustainability. In this case, this study aims to provide an implementation model

that can be adopted by other manufacturing companies in Indonesia. By examining the implementation of KPI and RACI in PT XYZ Batam, it is hoped that the results of this study can provide useful insights for the manufacturing industry in Indonesia, which faces similar challenges in managing performance and operational responsibilities.

In this context, this study will develop a performance management model that not only helps companies in measuring performance with KPIs, but also clarifies the responsibilities and roles of each individual in the organization through the application of the RACI framework. Thus, this study has the potential to make a significant contribution, both to the companies involved, the academic world, and the practice of the manufacturing industry in general. In addition, the results of this study are expected to be a reference for future research that wants to examine the application of KPI and RACI in various industrial sectors.

METHOD

This study uses descriptive and explorative research design with qualitative and quantitative approaches (mixed-method). The main objective of this study is to formulate relevant KPIs and integrate them with the RACI Framework at PT XYZ Batam. This research will begin with a literature study to understand the concepts of KPI and RACI. Furthermore, there will be an analysis of the company's performance data, interviews with management, and observations of existing business processes. The Data obtained will be analyzed to formulate relevant KPIs, followed by the creation and validation of RACI matrix to support the implementation of these KPIs.

Data Collection Techniques

In this study, data were collected through three main techniques. First, a literature study was conducted to collect secondary data from journals, books, and publications that discuss KPI, RACI, and performance measurement. Second, direct observation was conducted at PT XYZ Batam to understand how duties and responsibilities are distributed in day-to-day operations. Finally, questionnaires are distributed to employees and management to collect data related to their performance, job satisfaction and role in the organization. The combination of these techniques allows the collection of complete and holistic data on the implementation of KPI and RACI in the company.

Population And Sample

In this study, sampling was carried out using a simple random sampling technique, which means that each member of the population has the same chance of being selected as a sample. This technique was chosen to ensure that every employee at PT XYZ Batam, regardless of department, has the same opportunity to be included in the research. In this way, the results of the study are expected to describe the general condition of the company without bias from specific departments or groups. The number of samples taken was 90 respondents based on calculations with a margin of error of 5% and a confidence level of 95%, which is considered quite representative for a population of 117 employees. The use of a 5% margin of error is standard in Social Research and management, which provides a balance between the accuracy of the results and the time and cost constraints in data collection. data analysis

The following are the stages of data analysis that will be carried out in the context of KPI formulation and application of the RACI framework at PT XYZ Batam:

1. Initial Data processing: Data collected through questionnaires will be inputted into SPSS for further processing. This initial data processing will include cleaning the data and checking the completeness of the response before more in-depth analysis is carried out.
2. Data encoding: to facilitate the analysis, the answers to the questionnaire that are qualitative will be encoded into quantitative. A 5-point Likert measurement scale will be used to convert responses into numerical data, where 1 = "strongly disagree", 2 = "disagree", 3 = "fairly agree", 4 = "agree", and 5 = "strongly agree".
3. Statistical tests: validity and reliability tests will be carried out to ensure that the measuring instruments used actually measure what is intended. The validity test aims to ensure that the questionnaire measures relevant concepts, while the reliability test will measure the internal consistency of the questionnaire, ensuring that the instrument produces consistent data.
4. RACI and KPI analysis: each role within the company will be associated with relevant KPIs. An analysis will be conducted to evaluate the suitability between the roles listed in the RACI framework and the achievement of the established KPIs. Thus, it can be seen to what extent the roles and responsibilities defined in the RACI support the achievement of the desired performance objectives.
5. Interpretation of Results: Results from statistical analysis will be interpreted to answer the research questions posed. Conclusions will be drawn based on the results of this analysis, providing insight into the effectiveness of the implementation of KPI and RACI framework in performance measurement at PT XYZ Batam.

RESULTS AND DISCUSSION

The data collection process in this study was carried out systematically to ensure the quality and reliability of the data obtained. Data were collected using a combination of questionnaire surveys, in-depth interviews, and direct observation. The questionnaire is designed with relevant statements to measure Key Performance Indicators (KPIs) related to the RACI framework. This instrument is distributed to employees of PT XYZ Batam who have a direct role in the implementation of KPIs, involving various levels of office to ensure broad representation. After the data were collected, validity testing was carried out using Pearson's correlation to ensure that each indicator in the questionnaire actually measured the concept in question. The results of the questionnaire can be seen in Table 1. up to table 4.

Table 1. Work Discipline Questionnaire

Criteria For Labor Discipline						
No.	**Statement**	**Answer Options**				
		STS	**TS**	**CS**	**S**	**SS**
1	I always arrive on time according to the established working hours.	0	4	29	47	10
2	I always complete the task before the given deadline.	0	4	35	45	6
3	I follow company procedures and policies without exception.	0	4	36	36	14
4	I rarely or never take time off for no apparent reason.	0	4	38	38	10
5	I always adhere to the safety rules established by the company.	0	4	30	42	14

Table 2. K3 Questionnaire

Criterion K3						
No.	**Statement**	**Answer Options**				
		STS	**TS**	**CS**	**S**	**SS**
1	The company provides adequate safety equipment for all employees.	0	4	15	54	17
2	I feel safe working in today's environment.	0	4	24	44	18
3	The safety training provided by the company is adequate.	0	4	21	46	19
4	I always use personal protective equipment (PPE) when working as required.	0	4	43	29	14
5	The company regularly conducts health checks for employees.	0	12	11	41	26

Table 3. Work Environment Questionnaire

Working Environment Criteria						
No.	**Statement**	**Answer Options**				
		STS	**TS**	**CS**	**S**	**SS**
1	I am comfortable with the physical conditions of my work environment.	0	6	22	46	16
2	Work facilities such as office space, tables, and chairs are adequate.	0	6	16	64	4
3	The relationship between colleagues in my environment is very good.	0	12	24	38	16
4	Cleanliness in the work environment is always well maintained.	0	6	18	54	12
5	I feel the work environment supports my productivity.	0	6	13	48	23

Table 4. Company Performance Questionnaire

Company Performance Criteria						
No.	**Statement**	**Answer Options**				
		STS	**TS**	**CS**	**S**	**SS**
1	I feel the company achieves the targets it has set every year.	0	3	23	48	16
2	The company has always fulfilled its commitment to customers	0	3	20	52	15
3	My performance contributes significantly to the success of the company.	0	3	28	46	13
4	The company is able to compete well in the market.	0	3	5	67	15
5	I believe that the company has good growth prospects in the future.	0	3	16	62	9

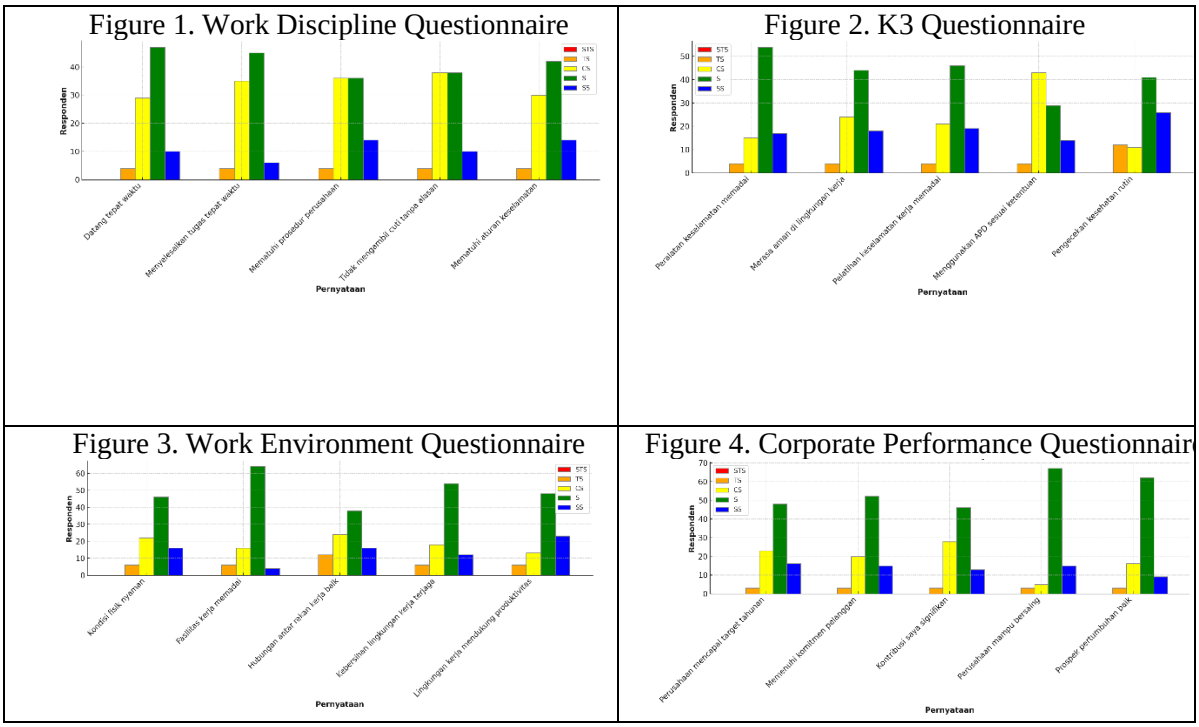

Figure 1. results of work discipline questionnaire, Figure 2. K3, Figure 3. work environment and Figure 4. company performance

Based on these graphs can be interpreted:

1) Graph 1 of the work discipline questionnaire, showing respondents ' perceptions of work discipline, with the majority of responses in the "Agree" and "strongly agree" categories."
2) Graph 2 of the K3 questionnaire, illustrates respondents ' perceptions of Occupational Safety and health aspects, with some room for improvement in routine health checks.
3) Graph 3 of the work environment questionnaire, illustrates the conditions of the work environment, with dominant responses in the categories "agree" and "strongly agree," although there are some notes on the relationship between colleagues.
4) Graph 4 of the company performance questionnaire, showing respondents ' confidence in the company's ability to compete, with most responses being in the positive category.

Testing Data

In the Data Testing section, measures are taken to ensure the reliability and accuracy of the data obtained from the questionnaire. First, validity tests are carried out to ensure that measurement instruments, such as questionnaires, actually measure the variables in question, namely KPIs related to work discipline, K3, work environment, and company performance. This validity test uses Pearson correlation to ensure the relevance between the indicators in the questionnaire with the measured variables. Furthermore, reliability tests were performed to measure the internal consistency of the instrument using Cronbach's Alpha. A value greater than 0.7 indicates that the instrument used can produce consistent and reliable data.

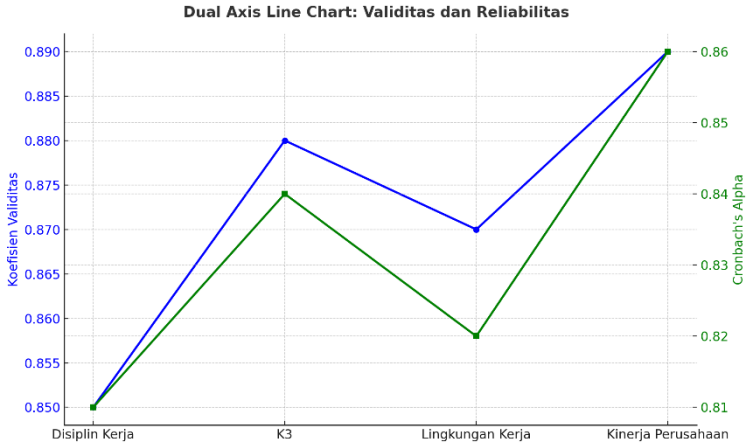

Figure 5. results of testing the validity and reliability of data respondents

Figure 5. shows that all aspects tested have high validity (coefficient of validity > 0.85) and strong reliability (Cronbach's Alpha > 0.80). Aspects of the company's performance stand out with the highest scores, while other aspects remain in the category of valid and reliable. This confirms that the instruments used in this study were able to measure the concept accurately and consistently.

RACI and KPI Analysis

This section of the RACI and KPI analysis, discusses the analysis of the relationship between Key Performance Indicators (KPIs) that have been set with the roles covered in the RACI framework for various aspects of organizational performance at PT XYZ Batam. In this section, each KPI related to work discipline, Occupational Safety and health (K3), work environment, and company performance has been formulated in accordance with the roles and responsibilities identified in the RACI framework (tables 5 to 8). For each aspect, an analysis of specific roles that are responsible for managing, implementing, consulting, and informing about the achievement of KPIs is carried out. The analysis begins with the identification of relevant KPIs that can measure performance within those areas, followed by the Association of these indicators with the role of RACI to ensure a clear distribution of responsibilities. By linking RACI roles with established KPIs, it aims to understand the influence of each role in achieving performance targets, increasing accountability, and encouraging collaboration between departments. KPI results with RACI framework can be seen in Table 5. to table 8.

Table 5. KPI of work discipline with FRMAWORK RACI

KPI target work	discipline	Actual	R	A	C	I
1. Degree Of Punctuality	98%	95,56%	Supervisor	Manajer HRD	Semua Karyawan	Top Manajemen
2. The rate of timely completion of tasks	98%	95,56%	All Employees	Manajer HRD	Supervisor HRD	Top Manajemen
3. Procedure compliance rate	99%	95,56%	All Employees	Manajer HRD	Supervisor Hrd	Top Manajemen
4. Attendance rate	99%	95,56%	All Employees	Manajer HRD	Supervisor HRD	Top Manajemen
5. Safety compliance level	100%	95,56%	Supervisor Safety	Manajer Safety	Supervisor HRD	All Employees

Source: data processing results

Table 6. KPI Matrix K3 and RACI

KPI K3	Target	Actual	R	A	C	I
1. Level Of Availability Of Safety Equipment	98%	95,56%	Supervisor Facility	Manajer Safety	Supervisor HRD	All Employees
2. The Level Of Perception Of The Safety Of The Working Environment	98%	95,56%	Employees	Manajer Safety	Supervisor Safety	Top Manajemen
3. Adequacy Level Of Safety Training	99%	95,56%	Manajer HRD	Manajer Safety	Supervisor HRD	All Employees
4. PPE usage compliance rate	100%	95,56%	Supervisor Facility	Manajer Safety	Supervisor HRD	Top Manajemen
5. Level Of Implementation Of Health Checks	95%	86,67%	Manajer HRD	Manajer Safety	Supervisor HRD	All Employees

Source: data processing results

Table 7. KPI matrix of work environment and RACI

KPI Working Environment	Target	Actual	R	A	C	I
1. Comfort Level Of Physical Condition	95%	93,33%	Supervisor Facility	Manajer HRD	Supervisor HRD	All Employees
2. Level Of Adequacy Of Work Facilities	96%	93,33%	Employees	Manajer HRD	Supervisor Safety	Top Manajemen
3. The Level Of Quality Of Relations Between Employees	90%	86,67%	Manajer HRD	Manajer HRD	Supervisor HRD	All Employees
4. The Level Of Cleanliness Of The Working Environment	97%	93,33%	Supervisor Facility	Manajer HRD	Supervisor HRD	Top Manajemen
5. Level of Environmental support to productivity	95%	93,33%	Manajer Safety	Manajer HRD	Supervisor HRD	All Employees

Source: data processing results

Table 8. KPI matrix of company performance and RACI

KPI Company Performance	Target	Actual	R	A	C	I
1. Level Of Achievement Of Corporate Targets	98%	96,67%	Manajer Marketing	CEO	CFO	All Employees
2. Level Of Fulfillment Of Customer Commitments	99%	96,67%	Customer Service Manager	COO	Sales Manager	All Employees
3. Individual Performance Contribution Rate	97%	96,67%	Manajer HRD	Manajer Marketing	Supervisor HRD	All Employees
4. The Level Of Competitiveness Of The Company	98%	96,67%	Manajer Marketing	CEO	CFO	Stake Holder
5. Confidence in growth prospects	97%	96,67%	Manajer Marketing	CEO	BOD	All Employees

Source: data processing results

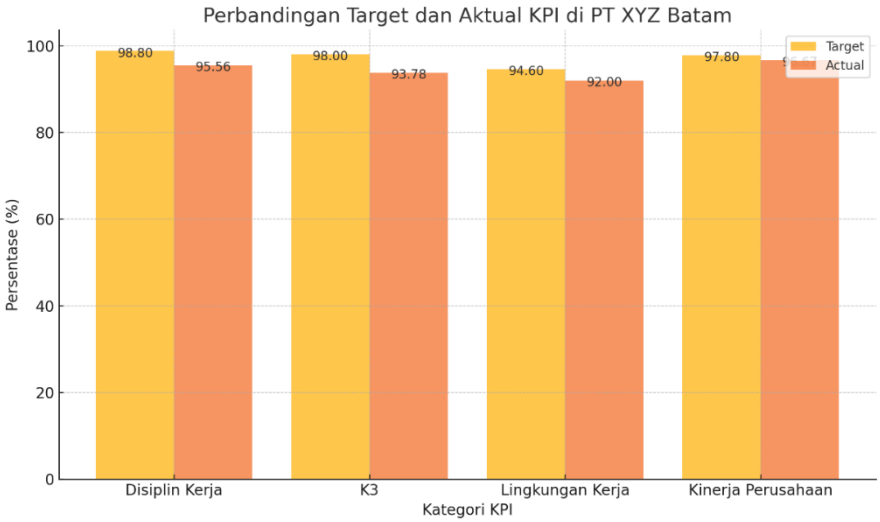

Figure 6. comparison of Target and actual KPI in PT XYZ Batam

The graph shows the comparison between targets and actual achievements for three main KPI categories: work discipline, Occupational Safety and health (K3), and work environment. Overall, there is a gap between the targets set by the company and the actual results achieved in each category.

1. Work discipline: the KPI Target for work discipline was set at 98%, while the actual achievement reached 95.56%. Despite approaching the target, there is a gap of 2.44%. This indicates the need for improvement in aspects of work discipline, such as punctuality, completion of tasks before deadlines, and compliance with company procedures.
2. Occupational Safety and health (K3): in the K3 category, the KPI target is also 98%, but the actual achievement is the same as work discipline, which is 95.56%. This gap illustrates the need to improve on several important elements, such as the provision of safety equipment, adequate training, and compliance with the use of personal protective equipment (PPE).
3. Work environment: for the work environment, the KPI target set is 95%, while the actual achievement is 93.33%, with a gap of 1.67%. This category includes factors such as the comfort of physical conditions, the adequacy of work facilities, and environmental support for productivity. Although the gap is relatively smaller compared to other categories, improvements are still needed to ensure that the work environment can support optimal employee performance.
4. Company performance: in this category, the average KPI target is set at 97.8%, while the actual achievement is 96.67%. Although the company's performance is almost optimal, the gap of 1.13% indicates that improvements in the aspects of fulfilling customer commitments and individual contributions can provide better results.
5. The gap seen in these three categories shows that although PT XYZ Batam has achieved a good level of performance, there is still room for improvement so that KPI targets can be fully achieved. A clear implementation of the RACI framework can be a solution to improve accountability, collaboration, and efficiency in achieving KPI targets. Measures such as additional training, periodic evaluations, and improvements to work facilities can also help narrow this gap.

CONCLUSION

Based on the results of the analysis and discussion, this study concludes that several KPIs have been formulated to be relevant, specific, measurable, and aligned with the company's needs. Key KPIs include the level of compliance with occupational safety rules in the K3

category, the comfort level of physical conditions and work facilities in the work environment category, and the timely completion of tasks in the labor discipline category. Furthermore, the RACI framework has been implemented to clarify responsibilities related to achieving these KPIs. The division of roles as Responsible (R), Accountable (A), Consulted (C), and Informed (I) helps prevent overlapping responsibilities and enhances accountability within the organization. For instance, in the KPI concerning compliance with the use of personal protective equipment (PPE), the Facility Supervisor acts as Responsible, while the Safety Manager serves as Accountable.

The results show that the combination of clear KPIs and the RACI framework improves accountability and collaboration among departments. Each individual understands their specific role, minimizing role conflicts and ensuring task performance efficiency. This improvement is evident in the enhanced performance in areas such as labor discipline, K3, and the work environment. Although the company's overall performance is commendable, some gaps remain between targets and actual achievements in certain KPIs. For example, in the K3 category, there is a need to increase the frequency of routine health checks. In the work environment category, strengthening relationships among colleagues is necessary to foster better collaboration. Lastly, in the labor discipline category, there is a need to emphasize the efficiency of task completion.

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