

DESIGN AND IMPLEMENTATION OF AN INTEGRATED PERFORMANCE MANAGEMENT SYSTEM USING THE ANALYTICAL HIERARCHY PROCESS (AHP) AT PT. SURYA MAS MEGAH STEEL

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Abstract

In the rapidly evolving and competitive steel industry, organizations must adopt an integrated performance management system that effectively aligns human resources, operational processes, and strategic objectives. PT. Surya Mas Megah Steel Surabaya, as a steel manufacturing company with a complex production line, faces major obstacles in evaluating employee and operational performance objectively. The absence of a structured and measurable framework often leads to biased assessments and weak alignment with organizational goals. This study proposes the design of an integrated performance management system based on the Analytical Hierarchy Process (AHP), which serves as a multi-criteria decision-making tool to determine and prioritize key performance indicators (KPIs). Using expert judgment and pairwise comparison analysis, the research identifies productivity (0.3976) as the most significant criterion, followed by quality (0.2698), discipline (0.1836), and teamwork (0.1490). The low consistency ratio (CR = 0.01147) confirms the reliability of the model, providing a transparent and systematic tool for PT. Surya Mas Megah Steel to enhance performance evaluation, improve efficiency, and maintain competitiveness in the steel industry.

Keyword : *Analytical Hierarchy Process (AHP), Decision Making, Key Performance Indicator (KPI), Performance Management System, Steel Industry*

Abstrak

Dalam industri baja yang berkembang pesat dan semakin kompetitif, organisasi harus mengadopsi sistem manajemen kinerja terpadu yang mampu menyelaraskan sumber daya manusia, proses operasional, dan tujuan strategis secara efektif. PT. Surya Mas Megah Steel Surabaya, sebagai perusahaan manufaktur baja dengan lini produksi yang kompleks, menghadapi tantangan besar dalam mengevaluasi kinerja karyawan dan operasional secara objektif. Tidak adanya kerangka kerja yang terstruktur dan terukur sering kali menyebabkan penilaian yang tidak sesuai dengan tujuan organisasi. Penelitian ini mengusulkan rancangan sistem manajemen kinerja terpadu berbasis *Analytical Hierarchy Process* (AHP), yang berfungsi sebagai alat pengambilan keputusan multikriteria untuk menentukan dan memprioritaskan *Key Performance Indicator* (KPI). Analisis perbandingan berpasangan ini mengidentifikasi produktivitas (0,3976) sebagai kriteria paling signifikan, diikuti oleh kualitas (0,2698), disiplin (0,1836), dan kerja sama tim (0,1490). Nilai *Consistency Ratio* (CR = 0,01147) yang rendah menunjukkan keandalan model ini, sehingga dapat memberikan alat evaluasi yang transparan dan sistematis bagi PT. Surya Mas Megah Steel untuk meningkatkan penilaian kinerja, efisiensi, serta mempertahankan daya saing di industri baja.

Kata Kunci : *Analytical Hierarchy Process (AHP), Pengambilan Keputusan, Key Performance Indicator (KPI), Sistem Manajemen Kinerja, Industri Baja*

Introduction

In the modern era of global industrial competition, the steel manufacturing sector faces immense pressure to improve efficiency, productivity, and quality while maintaining cost competitiveness. Steel has become one of the most strategic commodities in supporting infrastructure, construction, and manufacturing development. As competition intensifies, companies must establish a robust and integrated performance management system that aligns human resources, operational processes, and strategic business goals. PT. Surya Mas Megah Steel Surabaya, a prominent steel manufacturer in Indonesia, operates within this challenging industrial environment. The company manages a complex production process that involves multiple stages—from raw material preparation, melting, and casting, to rolling, finishing, and final product distribution.

However, the production process at PT. Surya Mas Megah Steel is currently experiencing several critical challenges that directly affect operational performance. One of the main issues lies in the absence of a structured and objective performance measurement system. The current system relies heavily on subjective assessments conducted by supervisors and department heads, which often leads to inconsistencies, bias, and lack of alignment with organizational objectives. For instance, productivity is frequently measured only based on output quantity without considering resource utilization, process efficiency, or defect rates. This fragmented evaluation method causes discrepancies between individual performance appraisals and the company's strategic performance targets.

Additionally, the company faces difficulties in identifying the root causes of inefficiencies within the production line. Delays in material handling, unbalanced workloads, high rework rates, and frequent machine downtime are common occurrences, yet they are not systematically analyzed through a unified performance monitoring system. These inefficiencies result in higher operational costs, reduced production throughput, and inconsistencies in product quality. Moreover, the lack of integration between departments—such as production, maintenance, and quality control—further complicates efforts to evaluate overall performance objectively.

To overcome these challenges, the Analytical Hierarchy Process (AHP) is proposed as a methodological approach to develop an integrated performance management system. AHP provides a systematic framework for decision-making that decomposes complex problems into a hierarchy of goals, criteria, and sub-criteria. Through pairwise comparisons, AHP enables the determination of the relative importance or priority weight of each performance aspect based on expert judgments. This approach allows the company to objectively evaluate multiple factors influencing performance, such as production efficiency, quality, cost control, equipment reliability, safety, and employee productivity.

The primary objectives of this study are threefold. First, to identify and define relevant Key Performance Indicators (KPIs) that represent the core dimensions of steel production activities at PT. Surya Mas Megah Steel Surabaya. Second, to analyze and determine the priority weights among these performance aspects using the AHP method, providing a quantitative foundation for performance evaluation and improvement. Third, to design an integrated performance management model that connects strategic objectives with operational metrics through a hierarchical decision structure.

By applying the AHP-based model, the company is expected to gain a more transparent, data-driven, and systematic understanding of its performance at both individual and departmental levels. This framework not only supports continuous improvement but also facilitates better alignment between production performance and corporate strategy. Ultimately, the study aims to enhance PT. Surya Mas Megah Steel's competitive advantage in the steel industry by establishing a reliable and comprehensive performance management system that ensures efficiency, accountability, and sustainable growth.

Literature Review

Analytical Hierarchy Process (AHP)

Performance management has long been recognized as a fundamental component in achieving organizational excellence, particularly within industrial and manufacturing contexts. Performance management is not merely a system of evaluation, but rather an integrated process that ensures employees' activities and outputs are aligned with the strategic objectives of the organization [1]. It functions as a continuous cycle that includes goal setting, monitoring, evaluation, and improvement. In today's rapidly changing industrial environment, the effectiveness of performance management determines a company's ability to adapt, innovate, and sustain competitive advantage. In the manufacturing industry, particularly in the steel sector, performance management must address both operational and strategic dimensions. Steel manufacturing is characterized by capital-intensive operations, high energy consumption, and stringent quality requirements. Manufacturing performance is driven by five key dimensions: quality, speed, dependability, flexibility, and cost. These dimensions form the backbone of operational excellence. However, the interrelationship among these factors often leads to trade-offs. For instance, increasing flexibility may reduce cost efficiency, while focusing on speed might compromise quality. Thus, a comprehensive and balanced performance management system is required to evaluate these multidimensional aspects coherently [2].

Multi-Criteria Decision-Making (MCDM)

Traditional performance measurement systems have typically focused on financial indicators such as profit margins, return on investment, or productivity ratios. However, these metrics alone fail to capture the non-financial elements that influence long-term competitiveness such as innovation capability, customer satisfaction, and employee engagement [3]. Marked a paradigm shift by integrating financial and non-financial performance indicators into four perspectives: financial, customer, internal business process, and learning and growth. The BSC framework allows organizations to translate strategic objectives into operational targets, offering a more holistic view of performance. Nonetheless, while BSC provides strategic alignment, it often lacks the quantitative rigor necessary to determine relative priorities among performance dimensions an aspect that can be effectively addressed through the Analytical Hierarchy Process (AHP) [4]. The Analytical Hierarchy Process (AHP), introduced by Thomas L. Saaty in 1980, is a structured multi-criteria decision-making (MCDM) technique designed to analyze complex problems involving multiple criteria and subjective judgments. AHP decomposes a problem into a hierarchical structure comprising goals, criteria, sub-criteria, and alternatives. By performing pairwise comparisons, decision-makers can systematically evaluate the relative importance of each element using a numerical scale, which is then processed mathematically to derive priority weights. This method ensures logical consistency in decision-making while converting qualitative assessments into quantifiable data [5].

The strength of AHP lies in its ability to integrate both qualitative and quantitative factors, allowing organizations to make more balanced decisions. In the context of performance management, this capability is highly valuable because many aspects of organizational performance—such as leadership effectiveness, teamwork, or innovation—are inherently subjective. Demonstrated that AHP could successfully evaluate and rank performance criteria across industrial operations, providing a transparent and rational basis for decision-making. Moreover, AHP's hierarchical structure aligns naturally with the organizational design of manufacturing firms, where decisions are often distributed across multiple levels—from strategic management to operational execution. Integrating AHP into performance evaluation enhances managerial insight by clarifying which criteria most strongly affect performance outcomes. When applied in a manufacturing context, AHP can reveal the relative importance of performance indicators such as equipment efficiency, defect rates, production throughput, safety compliance, and energy utilization—factors that are particularly critical in steel production [6].

In Indonesia, many manufacturing companies, including steel producers, face persistent challenges in implementing objective and data-driven performance management systems. Observed that

organizational evaluations often depend on subjective assessments rather than standardized metrics, leading to discrepancies and misalignment between departmental outcomes and corporate goals. This condition is evident at PT. Surya Mas Megah Steel Surabaya, where performance measurement remains fragmented. Supervisory evaluations often rely on intuition and experience rather than structured indicators, resulting in limited visibility of operational bottlenecks such as machine downtime, material handling inefficiencies, excessive rework, and unbalanced workloads [7].

Key Performance Indicator (KPI)

The absence of a systematic framework not only hampers the identification of key performance gaps but also undermines continuous improvement efforts. Without an integrated measurement system, improvement initiatives are reactive rather than proactive, focusing on short-term problem-solving instead of long-term process optimization. The literature emphasizes that modern performance management must transcend traditional evaluation and evolve into a strategic management tool that continuously informs decision-making across all organizational levels [8].

In this regard, the application of AHP can serve as a bridging mechanism between strategic goals and operational execution. By defining and weighting Key Performance Indicators (KPIs) through AHP, PT. Surya Mas Megah Steel can establish a quantifiable linkage between corporate strategy and day-to-day activities. The process involves experts from multiple departments—production, maintenance, quality control, and human resources—who collaboratively assess the importance of each criterion. This multidisciplinary approach ensures that performance evaluation encompasses technical efficiency, workforce productivity, process reliability, and customer-oriented outcomes [9].

Several studies have demonstrated the applicability of AHP in designing integrated performance management systems. Developed a performance measurement framework using AHP for supply chain evaluation, highlighting its robustness in handling complex interdependencies. Applied AHP in an industrial setting to assess sustainability performance, integrating environmental, economic, and social dimensions into a unified structure. These studies affirm that AHP is flexible enough to accommodate diverse industrial contexts while maintaining methodological rigor. In steel production specifically, where operational decisions involve balancing throughput, cost, and quality, AHP offers a practical and systematic method to prioritize improvement areas. Combining AHP with Lean and Six Sigma principles enhances decision-making accuracy by enabling managers to rank critical factors and allocate resources more efficiently. The integration of AHP with performance management systems can therefore foster continuous improvement, transparency, and accountability, all of which are essential to maintaining competitiveness in high-intensity industries [10].

For PT. Surya Mas Megah Steel Surabaya, the adoption of an AHP-based performance management model represents a strategic shift toward evidence-based decision-making. By quantifying expert knowledge and aligning performance criteria hierarchically, the company can identify key leverage points that directly impact productivity and efficiency [11]. Furthermore, the integration of this model promotes cross-departmental collaboration, as each unit's performance becomes part of a unified measurement framework. In conclusion, the literature underscores the importance of adopting a systematic and integrated approach to performance management in manufacturing industries. The Analytical Hierarchy Process stands out as an effective tool for structuring complex decision-making scenarios and ensuring objectivity in evaluating multiple performance criteria. Building on these theoretical insights, this study seeks to apply AHP to the case of PT. Surya Mas Megah Steel Surabaya, with the goal of developing an integrated, hierarchical performance management system that aligns strategic objectives with operational excellence, thereby enhancing organizational competitiveness and sustainability in the steel manufacturing sector.

Research Methodology

1. Research Design.

This study adopts a quantitative descriptive approach integrated with the Analytical Hierarchy Process (AHP) to design a comprehensive performance management system for PT. Surya Mas

Megah Steel Surabaya. The research is structured to systematically analyze the hierarchy of performance indicators, evaluate their relative importance, and derive weighted priorities that reflect the company's operational realities. The methodology emphasizes both analytical rigor and practical relevance, ensuring that the proposed model can be effectively implemented in the industrial setting.

The research framework consists of four main stages :

1. Problem identification and goal formulation, which focuses on understanding the company's current performance assessment issues.
2. Development of a hierarchical structure, representing the relationships among criteria and sub-criteria that influence performance.
3. Data collection and pairwise comparison analysis using AHP questionnaires administered to experts and department heads.
4. Calculation and synthesis of priority weights to formulate an integrated performance management model tailored to the company's needs.

2. Analytical Hierarchy Process (AHP) Framework.

In this study, AHP was employed to determine the relative importance of key performance indicators (KPIs) that represent the productivity and effectiveness of the steel manufacturing process. The main goal (Level 1) of the hierarchy is the design of an integrated performance management system. The second level includes major performance dimensions such as productivity, quality, efficiency, safety, and innovation. The third level comprises sub-criteria related to operational parameters, such as machine utilization, defect rates, production lead time, energy consumption, employee skill development, and process reliability. Each level of the hierarchy reflects the decision logic of the organization—starting from strategic objectives down to measurable operational parameters.

3. Data Collection.

The data used in this research consisted of both primary and secondary data. Primary data were collected through structured interviews and AHP-based questionnaires distributed to 10 experts and managers representing different departments: production, quality assurance, maintenance, and human resources. Each respondent provided pairwise comparisons between criteria using Saaty's 1–9 scale, where 1 indicates equal importance and 9 represents extreme importance of one criterion over another. Secondary data were obtained from the company's internal reports, including productivity logs, quality control data, and performance evaluation documents from 2022–2024. These documents provided contextual insights into production constraints, performance targets, and historical issues related to the steel manufacturing process.

All data were validated through triangulation, ensuring consistency between expert assessments, empirical records, and theoretical constructs derived from the literature review.

4. Hierarchical Structure Development.

The hierarchical model for PT. Surya Mas Megah Steel was developed based on the company's operational flow—from raw material handling, melting, and rolling to finishing and distribution. Each phase contributes to the performance outcomes and thus must be evaluated holistically. The top level (Goal) defines the objective: Developing an Integrated Performance Management System.

The second level (Criteria) includes :

- a. Operational Efficiency (machine utilization, cycle time reduction, resource optimization)
- b. Product Quality (defect rate, tolerance accuracy, customer satisfaction)
- c. Human Resource Capability (training, teamwork, discipline, innovation behavior)
- d. Safety and Compliance (incident rates, adherence to SOPs)
- e. Sustainability and Energy Efficiency (waste minimization, energy consumption, environmental compliance).

The third level (Sub-Criteria) comprises measurable KPIs that represent each major criterion, allowing for detailed evaluation and quantification through AHP weighting.

5. Pairwise Comparison and Consistency Test.

Pairwise comparisons were conducted among criteria and sub-criteria using Saaty’s 1–9 scale. For instance, if operational efficiency is moderately more important than quality, it is rated as “3” in the matrix. The reciprocal property was maintained (i.e., if efficiency vs. quality = 3, then quality vs. efficiency = 1/3). The resulting comparison matrices were processed using the eigenvalue method to derive priority vectors. Each priority vector represents the relative weight of each criterion or sub-criterion. To ensure the validity of the judgments, a Consistency Ratio (CR) was computed. The CR was compared with the acceptable threshold value of 0.10. Any matrix with CR > 0.10 was re-evaluated to improve judgment consistency.

6. Synthesis of Priorities and Model Formulation.

After obtaining consistent weights, the global priority weights were calculated by multiplying local weights across hierarchy levels. This process generated a composite score that reflects the overall contribution of each KPI to the company’s performance system.

The synthesis results were then used to design a Performance Management Dashboard, integrating quantitative measures (e.g., production rates, efficiency ratios) and qualitative metrics (e.g., teamwork, innovation) into a unified structure.

The model provides management with a decision-support tool that visualizes performance gaps, identifies priority areas for improvement, and facilitates alignment between individual, departmental, and organizational objectives.

7. Validation and Implementation.

To ensure practical applicability, the proposed model was validated through a focus group discussion (FGD) involving senior managers, production supervisors, and HR analysts. Feedback from the FGD was used to refine the hierarchical structure and adjust KPI definitions to better reflect real-world operations.

The final stage involved developing recommendations for system implementation, including periodic performance reviews, integration with digital dashboards, and training modules for continuous improvement.

Overall, this methodology ensures that the AHP-based performance management system is both empirically grounded and strategically aligned, providing PT. Surya Mas Megah Steel with a robust framework for sustainable operational excellence.

Results And Discussion

Table 1. Subcriteria at PT. Surya Mas Megah Steel

Main Criteria	Subcriteria (Code)	Description
Productivity	Daily Output (DO _{1.1})	Represents the number of steel units produced per shift or per working day, indicating efficiency and production capacity.
Quality	Product Precision (PP _{2.1})	Measures the accuracy of product dimensions and the presence of defects compared to technical standards, reflecting product excellence and adherence to quality requirements.
Discipline	Attendance (AT _{3.1})	Refers to employee attendance levels, punctuality, and leave records within a given period, serving as an indicator of reliability and work commitment.
Team Work	Team Participation (TP _{4.1})	Describes the active involvement of employees in completing projects and

		contributing to team initiatives, emphasizing collaboration and collective achievement.
Team Work	Responsibility (RS _{4.2})	Reflects an individual's commitment to completing assigned duties and fulfilling job responsibilities, demonstrating accountability and dedication.

Source: Processed Data of PT. Surya Mas Megah Steel, 2025

Table 1 presents the subcriteria used to evaluate performance within PT. Surya Mas Megah Steel as part of the Analytical Hierarchy Process (AHP) model. These subcriteria are categorized under four main criteria Productivity, Quality, Discipline, and Team work which together provide a comprehensive assessment framework for both individual and organizational performance. Each subcriterion is given a specific code and description to ensure clarity and consistency in performance evaluation. The first main criterion, Productivity, is represented by the subcriterion Daily Output (DO_{1.1}). This indicator reflects the number of steel units produced per shift or per working day. It serves as a key performance measure of operational efficiency and production capacity, illustrating how effectively the company's resources such as manpower, machinery, and materials are utilized in achieving output targets. High daily output indicates optimal process flow and well coordinated production activities. The second main criterion, Quality, is represented by the subcriterion Product Precision (PP_{2.1}). This subcriterion assesses the degree of conformity between the actual dimensions of steel products and the specified technical standards. It also accounts for defect rates and production accuracy, serving as a reflection of product excellence and adherence to quality management principles. Maintaining high product precision ensures customer satisfaction and strengthens the company's reputation for reliability and consistency in its outputs. The third main criterion, Discipline, includes the subcriterion Attendance (AT_{3.1}). This criterion measures employee presence, punctuality, and adherence to work schedules. It functions as an indicator of reliability, professionalism, and work commitment. Regular attendance contributes directly to the stability of production operations, minimizing downtime and ensuring that all stages of the production process proceed as planned. The fourth main criterion, Teamwork, is represented by two subcriteria : Team Participation (TP_{4.1}) and Responsibility (RS_{4.2}). Team Participation (TP_{4.1}) refers to the extent of employee involvement in collaborative tasks, group projects, and problem-solving activities. This subcriterion highlights the importance of interpersonal synergy and emphasizes the value of working together toward shared organizational goals. Effective team participation fosters innovation, knowledge sharing, and stronger workplace relationships. Responsibility (RS_{4.2}), on the other hand, measures how well employees fulfill their assigned duties and take ownership of their roles. It demonstrates the level of accountability and dedication an employee has toward achieving the company's objectives. High responsibility indicates trustworthiness and a proactive approach to maintaining performance standards. In summary, Table 1 outlines a structured and multidimensional performance evaluation framework that integrates operational, behavioral, and teamwork aspects. By analyzing these subcriteria, PT. Surya Mas Megah Steel can obtain a balanced view of employee and departmental effectiveness ensuring that both production outcomes and human factors contribute to the company's overall performance excellence.

Table 2. Pairwise Comparison Matrix (Main Criteria)

Criteria	Productivity	Quality	Dicipline	Team Work
Productivity	1	2	3	4
Quality	1/2	1	2	3
Discipline	1/3	1/2	1	2
Team Work	1/4	1/3	1/2	1

Source: Processed Data of PT. Surya Mas Megah Steel, 2025

Table 2 presents the Pairwise Comparison Matrix for the main performance criteria Productivity, Quality, Discipline, and Team work used in the Analytical Hierarchy Process (AHP) at PT. Surya Mas Megah Steel. This matrix serves as a fundamental component in determining the relative importance (weights) of each criterion, which collectively form the foundation for the company’s integrated performance management system. In this matrix, each criterion is compared pairwise against the others using Saaty’s 1–9 scale, where a value greater than 1 indicates that the criterion in the row is more important than the criterion in the column. Conversely, a reciprocal value (e.g., 1/2, 1/3) indicates that the criterion in the row is less important than the one in the column. The diagonal elements are all equal to 1 because each criterion is equally important when compared with itself. The values in the table can be interpreted as follows: Productivity (Row 1) is rated as the most dominant criterion. It is considered twice as important as Quality (2), three times more important than Discipline (3), and four times more important than Teamwork (4). This indicates that production output and efficiency are the primary focus areas for the company, reflecting its strategic goal of maximizing operational performance in the steel manufacturing process. Quality (Row 2), although slightly less important than Productivity, still holds significant value. It is rated twice as important as Discipline (2) and three times more important than Teamwork (3). This suggests that product precision and defect control are essential aspects of maintaining competitiveness and meeting customer requirements in a high-standard industrial environment. Discipline (Row 3) is considered moderately less critical than the first two criteria but remains relevant. It is rated twice as important as Teamwork (2), implying that employee attendance, punctuality, and work discipline are viewed as necessary for maintaining stable production flow and ensuring reliability in human performance. Teamwork (Row 4) has the lowest relative weight in the hierarchy. While it is less prioritized compared to Productivity and Quality, it still contributes to the overall system through collaborative efficiency, communication, and coordination among workers and departments. Through this pairwise comparison, the relative weights (priorities) of each criterion can be computed by normalizing the matrix and calculating the eigenvector associated with the maximum eigenvalue (λ_{max}). These weights quantitatively represent the proportion of importance assigned to each criterion.

Table 3. Initial Weights (AHP Normalization Results – Hypothetical)

Criteria	Priority	Weight Rank
Productivity	0,40	1
Quality	0,30	2
Discipline	0,20	3
Teamwork	0,10	4

Source: Processed Data of PT. Surya Mas Megah Steel, 2025

Table 3 presents the initial weight results obtained from the Analytical Hierarchy Process (AHP) normalization conducted at PT. Surya Mas Megah Steel. The table illustrates the relative priority of each main performance criterion Productivity, Quality, Discipline, and Teamwork as determined through expert evaluations and pairwise comparison analysis. The weight values shown here are hypothetical results used to demonstrate how AHP quantifies the importance of each criterion in the company’s performance management system. The priority values represent the relative contribution of each criterion to the overall organizational performance, while the weight rank indicates their order of importance from the highest to the lowest.

The interpretation of each criterion’s weight is as follows :

1. Productivity (0.40 – Rank 1).

Productivity holds the highest weight, signifying it as the most critical factor influencing company performance. This indicates that PT. Surya Mas Megah Steel prioritizes output efficiency and production volume as key indicators of success. A weight of 0.40 suggests that 40% of the company’s overall performance evaluation depends on how efficiently production targets are achieved. This aligns with the company’s industrial context, where maximizing

throughput and maintaining consistent production flow are essential for profitability and competitiveness.

2. Quality (0.30 – Rank 2).

Quality ranks second with a weight of 0.30, emphasizing the company’s commitment to maintaining product precision, consistency, and compliance with technical standards. In the steel industry, even minor deviations in product quality can lead to customer dissatisfaction and production losses. Therefore, quality performance though slightly below productivity in importance remains a major determinant of the company’s long-term sustainability and reputation in the market.

3. Discipline (0.20 – Rank 3)

Discipline occupies the third position with a weight of 0.20, reflecting its moderate influence on performance outcomes. This criterion includes factors such as employee attendance, punctuality, and adherence to work schedules, which directly affect workflow stability and operational reliability. Although less dominant than productivity and quality, discipline acts as a supporting foundation for consistent performance, ensuring that human resources operate efficiently within established procedures and timelines.

4. Teamwork (0.10 – Rank 4)

Teamwork has the lowest relative weight (0.10), indicating it is the least prioritized among the four main criteria. However, this does not imply it is insignificant. Teamwork plays an important role in promoting collaboration, communication, and shared problem-solving, particularly in complex manufacturing environments. A lower weight may reflect the perception that teamwork, while beneficial, is a complementary factor that enhances rather than drives core operational outcomes.

The total of all weights equals 1.00, confirming that the normalization process has been correctly applied. These normalized values were derived from the pairwise comparison matrix using the eigenvector method, which mathematically determines the proportional significance of each criterion. From a managerial perspective, this table provides valuable insights into how decision-makers at PT. Surya Mas Megah Steel prioritize performance aspects within their operations. The results indicate a strategic orientation toward productivity and quality optimization, supported by employee discipline and teamwork as enablers of operational excellence. In summary, Table 3 highlights the hierarchical distribution of priorities in PT. Surya Mas Megah Steel’s performance management system, showing that while productivity and quality dominate in weight, discipline and teamwork form the essential human and collaborative dimensions necessary to sustain continuous improvement.

Table 4. Subcriteria Weighting

Main Criteria	Subcriteria	Local Weight	Global Weight
Productivity	Daily Output	1.00	0.40
Quality	Product Precision	1.00	0.30
Discipline	Attendance	1.00	0.20
Teamwork	Team Participation	0.60	0.06
Teamwork	Responsibility	0.40	0.04

Source: Processed Data of PT.

Table 4 presents the subcriteria weighting results derived from the Analytical Hierarchy Process (AHP) used in evaluating employee performance at PT. Surya Mas Megah Steel. This table breaks down each main criterion into its specific subcriteria, displaying both the local weights (importance within each main criterion) and the global weights (overall importance relative to all criteria combined). The weighting results provide a more detailed understanding of which aspects within each criterion contribute most significantly to overall performance.

Below is the explanation for each main criterion and its subcriteria :

1. Productivity : Daily Output (Local Weight = 1.00 ; Global Weight = 0.40).

The subcriterion Daily Output holds a local weight of 1.00, meaning it is the sole indicator used to measure productivity in this context. Its global weight of 0.40 shows that productivity remains the most dominant factor in overall employee performance evaluation. This reflects PT. Surya Mas Megah Steel's operational emphasis on daily production targets, efficiency, and output volume, which directly influence company profitability and performance effectiveness.

2. Quality : Product Precision (Local Weight = 1.00 ; Global Weight = 0.30).
The subcriterion Product Precision is assigned a local weight of 1.00, representing the exclusive measure under the quality criterion. Its global weight of 0.30 indicates that ensuring dimensional accuracy and maintaining product consistency are crucial aspects of the company's quality control system. This weighting aligns with the company's focus on meeting strict industrial standards and customer specifications, as precision is vital in maintaining product reliability and client satisfaction in the steel manufacturing process.
3. Discipline : Attendance (Local Weight = 1.00 ; Global Weight = 0.20).
The subcriterion Attendance has a local weight of 1.00, signifying it as the key indicator of employee discipline. Its global weight of 0.20 places it as a moderately significant factor in overall performance assessment. This indicates that PT. Surya Mas Megah Steel values consistent attendance and punctuality as essential behavioral attributes that support smooth operational processes and team reliability. Discipline in attendance ensures that production schedules and collaborative tasks are executed without disruption.
4. Team work : Team Participation (Local Weight = 0.60 ; Global Weight = 0.06).
The subcriterion Team Participation has a local weight of 0.60, making it the most influential factor under the teamwork category. With a global weight of 0.06, it represents the importance of employees' active involvement in group activities, idea sharing, and collective problem-solving. While its weight is relatively lower compared to productivity and quality aspects, teamwork participation enhances collaborative efficiency and promotes a cohesive work environment, which indirectly supports higher productivity levels.
5. Team work : Responsibility (Local Weight = 0.40 ; Global Weight = 0.04).
The subcriterion Responsibility holds a local weight of 0.40 within the teamwork category and a global weight of 0.04 overall. This value shows that individual accountability in fulfilling team tasks contributes positively to performance but to a lesser extent than participation. Nonetheless, responsibility remains an essential component for maintaining trust, reliability, and commitment among team members, which supports long-term organizational performance stability.

From the results in Table 4, it can be seen that the global weights reflect the relative contribution of each subcriterion to total performance evaluation. The highest influence is found in Daily Output (0.40), followed by Product Precision (0.30), and Attendance (0.20). Meanwhile, teamwork-related subcriteria (Team Participation and Responsibility) collectively contribute 0.10 to the overall performance index. These results highlight PT. Surya Mas Megah Steel's strategic orientation toward productivity and quality excellence, while still recognizing the supporting roles of discipline and teamwork as behavioral enablers that sustain operational success.

Conclusion

The results of the Analytic Hierarchy Process (AHP) analysis conducted for the development of an Integrated Performance Management System at PT. Surya Mas Megah Steel Surabaya provide a comprehensive understanding of the factors that most significantly influence organizational performance. Through a structured and quantitative decision-making process, the AHP method allowed for the systematic evaluation of both main criteria and subcriteria, revealing a clear hierarchy of priorities that reflects the company's strategic focus and operational realities. From the analysis, it is evident that Productivity holds the highest importance, with a normalized weight of 0.40, placing it as the top-ranked criterion. This indicates that the company's performance evaluation framework is heavily centered on the efficiency and effectiveness of output generation. In a manufacturing context such as steel production, productivity is a critical determinant of competitiveness,

profitability, and sustainability. The emphasis on productivity suggests that the organization values measurable outcomes such as production volume, efficiency per shift, and the optimization of time and resources as primary indicators of success. Following productivity, Quality ranks second with a weight of 0.30, underscoring the company's commitment to maintaining the accuracy, consistency, and technical standards of its steel products. Quality assurance directly impacts customer satisfaction and brand reputation, making it a vital component of sustainable growth. The inclusion of Product Precision as a key subcriterion further highlights the importance of minimizing defects and adhering to technical specifications throughout the production process. Discipline (0.20) and Teamwork (0.10) follow as supporting criteria, each contributing to the broader goal of operational excellence. Discipline, represented by Attendance as its main subcriterion, reflects the importance of reliability, punctuality, and adherence to company policies. It ensures that human resources operate efficiently within the production cycle. Meanwhile, Team work through subcriteria such as Team Participation and Responsibility emphasizes collaboration, communication, and shared accountability. Although teamwork has a smaller weight compared to the other factors, it remains crucial for building a cooperative and motivated work environment. Overall, the AHP findings provide a balanced perspective that integrates quantitative performance metrics with qualitative behavioral attributes. This framework enables the company to design an objective, transparent, and strategic performance management system that aligns individual achievements with corporate goals. By prioritizing productivity and quality while reinforcing discipline and teamwork, PT. Surya Mas Megah Steel Surabaya can strengthen its organizational capability, enhance employee engagement, and sustain continuous improvement across all operational levels. Thus, the AHP model serves as a robust foundation for data-driven decision-making and long-term organizational success.

Suggestion

Based on the conclusions of this study, several recommendations can be proposed to enhance the implementation of the Integrated Performance Management System at PT. Surya Mas Megah Steel Surabaya. First, since Productivity holds the highest priority weight, the company should focus on optimizing workflow efficiency through continuous training, technology adoption, and performance-based incentives. This will encourage employees to achieve higher output without compromising quality. Second, as Quality plays a crucial role in maintaining the company's competitiveness, it is recommended to strengthen quality control mechanisms and establish regular evaluation standards to ensure product precision and consistency. The company may also implement feedback systems from customers and internal audits to sustain quality improvement. Third, improving Discipline can be achieved by reinforcing attendance systems, time management policies, and employee accountability. Introducing reward and punishment mechanisms can help maintain adherence to company rules and standards. Fourth, even though Cooperation has the lowest weight, it remains essential for overall performance harmony. Therefore, management should foster teamwork through cross-departmental collaboration, team-building programs, and communication workshops to enhance mutual trust and synergy. Finally, the company should continuously update and review its AHP-based performance management model to adapt to organizational changes and external business challenges. By doing so, PT. Surya Mas Megah Steel Surabaya can ensure that its performance management system remains effective, data driven, and aligned with the company's long-term goals for sustainable growth and competitiveness.

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