GIJTM
Greenation International Journal of Tourism and Management
+62 81210467572 https://research.e-greenation.org/GIJTM greenation.info@gmail.com
GREENATION

DOI: https://doi.org/10.38035/gijtm.v4i2.977

Evaluation of the Airport Operational Performance Assessment System: Integration of Balanced Scorecard, AHP, and OMAX in the Halim Perdanakusumah Operations Services Division

Danang Brahmantyo S[1], Susetya Nugroho[2], Cedaryana Cedaryana[3]
[1]Universitas Negeri Jakarta, Jakarta, Indonesia, danangbrahmantyo@unj.ac.id
[2]Universitas Negeri Jakarta, Jakarta, Indonesia
[3]Universitas Negeri Jakarta, Jakarta, Indonesia, cedaryana@unj.ac.id

Corresponding Author: danangbrahmantyo@unj.ac.id[1]

Abstract: This study aims to evaluate the operational performance appraisal system in the Perdanakusumah International Airport Operations Service Division and to analyze the integration of the Balanced Scorecard, Analytic Hierarchy Process, and Objective Matrix methods as a strategic performance evaluation model. The research employs a qualitative descriptive approach through observation, documentation studies, and analysis of operational performance indicators. The findings indicate that the existing appraisal system remains largely dominated by supervisor subjectivity, administrative indicators, and periodic manual evaluations that do not support real-time operational performance monitoring. The study identifies gaps in terms of transparency, strategic relevance, and the effectiveness of operational performance measurement. To address these issues, this research proposes an integrated model combining the Balanced Scorecard, AHP, and OMAX to enhance assessment objectivity, KPI prioritization, and operational performance monitoring. This integrated model enables the organization to align individual performance with airport strategic targets, improve monitoring accuracy, and support the development of a digital-based performance management system. This study contributes to the advancement of strategic performance management systems within the airport operational service sector.

Keyword: Analytic Hierarchy Process, Balanced Scorecard, Airport Operational Performance, Objective Matrix, Performance Assessment System.

INTRODUCTION

The aviation industry is one of the strategic sectors characterized by a high level of operational complexity, requiring an effective organizational management system to ensure flight safety, service quality, and operational efficiency. As the center of aviation activity, an airport not only serves as an air transportation facility but also as a public service organization that must be capable of continuously integrating aspects of safety, security, punctuality, service quality, and operational efficiency. Under these conditions, the quality of

operational human resources becomes one of the primary factors determining the success of an airport organization.

The performance appraisal system plays a crucial role in supporting organizational effectiveness, as it serves as an evaluation instrument for assessing individual contributions toward achieving the organization's strategic objectives. According to Armstrong (2021), performance management is a systematic approach used to enhance organizational effectiveness through the continuous processes of planning, monitoring, evaluating, and developing individual and organizational performance. The evolution of modern performance management systems indicates a paradigm shift from traditional performance appraisal toward continuous, data-driven performance management with real-time monitoring (Aguinis, 2023).

In the context of airports, the performance appraisal system functions not merely as an administrative human resource tool but also as an operational control mechanism that is directly linked to flight safety and service quality. Research by Rahman, Ahmed, and Karim (2021) demonstrates that airport organizations require a real-time operational performance monitoring system to enable fast and accurate decision-making. Furthermore, Hassan and Al-Shaikh (2022) explain that airport operational performance indicators must be integrated with the organization's strategic targets to enhance service effectiveness and aviation operational safety.

Nevertheless, the implementation of performance appraisal systems in airport environments still faces various challenges. Based on observations at the Halim Perdanakusuma International Airport Operations Service Division, the performance evaluation system currently employed remains predominantly based on the Direct Supervisor Assessment Form (Formulir Penilaian Atasan Langsung – FPAL). This system is highly dependent on supervisors' subjective perceptions, which may introduce appraisal bias and result in low objectivity in evaluating operational workers' performance. Consequently, the assessment outcomes have not been fully capable of reflecting the actual performance of workers in the field.

Moreover, some of the Key Performance Indicators (KPIs) currently utilized remain administratively oriented, such as attendance rates, work discipline, and procedural compliance, while strategic indicators related to service quality, operational safety, facility readiness, coordination effectiveness, and contributions to on-time performance have not been optimally integrated into the individual appraisal system. Marr (2021) explains that the overuse of administrative KPIs may reduce the relevance of the appraisal system to the organization's strategic needs. Research by Gunawan and Prakoso (2021) also indicates that KPI implementation in transportation service organizations still tends to focus on administrative aspects and has not been able to comprehensively reflect operational performance.

Another issue identified is the weakness of a real-time, data-driven operational performance monitoring system. The formal evaluation system, conducted only once or twice a year, is considered insufficiently relevant to the characteristics of an airport that operates 24 hours a day with high operational dynamics. As a result, the organization experiences delays in detecting performance declines and taking prompt corrective actions. Albrecht, Green, and Marty (2022) explain that modern organizations require a continuous performance monitoring system to ensure that performance evaluations become more objective, adaptive, and responsive to changes in the operational environment.

Previous studies have generally addressed airport organizational performance measurement using the Balanced Scorecard, Key Performance Indicators, or general operational productivity measurements. However, most of these studies still adopt a partial approach and have not integrated strategic priority weighting methods and performance

measurement normalization into a single comprehensive evaluation system. Furthermore, research specifically examining the evaluation systems for individual operational workers at airports remains relatively limited, thus highlighting the need for studies that can examine operational performance evaluation systems in a more strategic and integrated manner.

Given these conditions, this study employs an integration of the Balanced Scorecard, Analytic Hierarchy Process, and Objective Matrix as an approach to developing an airport operational performance appraisal system. The Balanced Scorecard approach is used to link individual indicators with organizational strategy through the financial, customer, internal business processes, and learning and growth perspectives. The Analytical Hierarchy Process method is applied to determine indicator priorities based on the strategic importance of airport operations, while the Objective Matrix method is used to normalize performance measurements into a single integrated evaluation system.

The objectives of this study are to evaluate the operational performance appraisal system within the Halim Perdanakusuma International Airport Operations Service Division, identify gaps in the implementation of the current evaluation system, and analyze the integration of the Balanced Scorecard, Analytical Hierarchy Process, and Objective Matrix as an alternative model for developing a more objective, strategic, and measurable airport operational performance appraisal system.

METHOD

This study employs a qualitative descriptive approach with a case study method. The qualitative descriptive approach is used because the research aims to gain an in-depth understanding of the operational performance appraisal system implemented within the airport organization and to identify gaps in the implementation of the operational employee performance evaluation system. According to Creswell (2020), qualitative research is used to explore and understand social and organizational phenomena based on actual field conditions. The case study method was chosen because the research focuses on an in-depth analysis of the performance appraisal system within the Halim Perdanakusuma International Airport Operations Service Division.

The research was conducted at the Halim Perdanakusuma International Airport Operations Service Division, located in South Jakarta, DKI Jakarta Province. The selection of the research site was based on the airport's operational characteristics, which involve a high level of complexity and a need for an objective performance evaluation system that is integrated with the organization's strategic targets. The research was conducted during the data collection and analysis period in the first quarter of 2026.

The research subjects consisted of operational employees and managerial personnel involved in the implementation of the performance appraisal system within the Operations Service Division. The subjects were determined using a purposive sampling technique, in which informants were selected based on specific considerations relevant to the research needs. This technique was employed to ensure that the data obtained were more pertinent to the research focus on the implementation of the airport's operational performance evaluation system.

The research data consisted of primary and secondary data. Primary data were obtained through observation of the operational performance appraisal process and analysis of the performance evaluation implementation conditions within the Operations Service Division. Meanwhile, secondary data were obtained through documentation studies and literature reviews derived from organizational documents, performance evaluation reports, scientific journals, books, and previous research related to performance management systems, the Balanced Scorecard, the Analytical Hierarchy Process (AHP), and the Objective Matrix (OMAX).

The research instruments used included observation guidelines, document analysis formats, and literature studies on airport operational performance assessment indicators. These instruments were used to identify the gaps between the current appraisal system and the strategic needs of a modern airport organization.

Data collection techniques included observation, documentation studies, and literature reviews. Observation was conducted to gain a direct understanding of the implementation of the operational performance evaluation system within the airport work environment. Documentation studies were conducted on performance appraisal documents, Key Performance Indicator (KPI) documents, and operational employee performance evaluation documents. Literature reviews were conducted to obtain a theoretical foundation and to compare the research findings with relevant previous studies.

The data analysis technique employed in this study followed the interactive analysis model of Miles, Huberman, and Saldaña (2020), which includes data reduction, data display, and conclusion drawing. Data reduction was carried out by selecting data relevant to the research focus on the evaluation of the airport operational performance appraisal system. Data were presented in the form of narratives and tables to facilitate the interpretation of the research findings. Subsequently, conclusions were drawn based on the interpretation of the data obtained throughout the research process.

In the analytical process, this study employed an integration of the Balanced Scorecard, the Analytic Hierarchy Process, and the Objective Matrix as a framework for evaluating the airport operational performance appraisal system. The Balanced Scorecard was used to identify the linkages between performance indicators and organizational strategy through the customer, financial, internal business processes, and learning and growth perspectives. The AHP method was applied to determine the priority of assessment indicators based on the strategic importance of airport operations. Meanwhile, the OMAX method was used to normalize performance measurements, thereby producing a more objective and measurable evaluation system.

RESULT AND DISCUSSION

This research was conducted at the Halim Perdanakusuma International Airport Operations Service Division, with the main focus of evaluating the implementation of the operational performance appraisal system applied to airport operational workers. The evaluation was carried out to identify gaps in the current performance appraisal system and to analyze the integration of the Balanced Scorecard, Analytic Hierarchy Process, and Objective Matrix as an approach to developing a more objective, strategic, and measurable performance evaluation system.

The research findings were obtained through observation of the implementation of the operational performance appraisal system, analysis of employee assessment documents, evaluation of Key Performance Indicator (KPI) metrics, and a review of the airport's operational performance monitoring system. The analysis was conducted using a qualitative descriptive approach to identify the main problems within the existing evaluation system and to formulate a model for developing a performance appraisal system that is more adaptive to the operational needs of a modern airport.

Existing Operational Performance Appraisal System

Based on the results of observations and documentation studies, the performance appraisal system within the Operations Service Division still employs a conventional approach through the Direct Supervisor Assessment Form (Formulir Penilaian Atasan Langsung – FPAL). This system is used as the primary instrument for evaluating the performance of airport operational employees.

Employee performance evaluations are conducted periodically, with the main focus on administrative aspects such as attendance rates, work discipline, compliance with procedures, and completion of routine tasks. However, indicators related to strategic operational performance—such as operational service quality, coordination effectiveness, operational safety, response speed to operational disruptions, facility readiness, and contributions to on-time performance—have not yet received an optimal proportion in the assessment.

The current evaluation system also remains highly dependent on supervisors' subjective perceptions. This condition results in assessment outcomes that have not been fully capable of representing the actual performance of operational workers in the field. Furthermore, the manually conducted evaluation process leads to low transparency and accuracy in performance appraisa.

These findings are consistent with the research conducted by Pratama and Hidayat (2022) on human resource management, which states that supervisor perception-based appraisal systems have the potential to generate evaluation bias and reduce the objectivity of employee performance measurement in public service organizations. Another study by Rahman et al. (2023) also shows that organizations with administratively based evaluation systems tend to experience difficulties in linking individual performance to the organization's strategic targets.

In the context of airport operations, which are highly complex and run 24 hours a day, a subjectivity-based evaluation system is considered insufficient to support the needs of continuous performance monitoring. Therefore, the organization requires an appraisal system based on actual operational data that is capable of portraying employee performance more objectively and measurably.

Figure 1. Flowchart of the Existing Performance Assessment System Using FPAL

Subjectivity Gap in Performance Evaluation

The research findings indicate that one of the main problems in the airport operational performance appraisal system is the dominance of subjectivity in the employee evaluation process. The current FPAL system still grants considerable authority to direct supervisors in determining employee performance evaluation outcomes, without the support of a real-time operational data-based monitoring system. As a result, the assessment results are heavily influenced by the supervisors' individual perceptions.

This condition gives rise to several issues, including:

1. low transparency in the evaluation system,
2. potential for unfair assessment,
3. misalignment between actual performance and evaluation results,
4. and decreased work motivation among operational employees.

Table 1. Performance Assessment Gap

Gap Findings	Percentage	Organizational Impact
Distrust of FPAL	35–45%	Reduce employee motivation and confidence
KPI is still administrative	20–30%	Does not support strategic targets
Monitoring is not real-time	Tall	Slow to detect performance degradation
Evaluation is still manual	Tall	Less objective assessment

The research findings indicate that the current appraisal system has not been able to support the needs of a modern airport organization, which requires evaluation based on actual operational performance. In the context of airport operations that run 24 hours a day, the use of a perception-based evaluation system is considered less effective, as it is unable to monitor employee performance on an ongoing basis.

These findings reinforce previous research conducted by Nugroho and Saputra (2021), which states that weak performance monitoring systems are one of the primary factors contributing to the low effectiveness of performance management in the public service sector. Research by Wijaya et al. (2024) also shows that the use of manual evaluation systems leads to low assessment accuracy and delays in organizational decision-making.

In addition to its impact on assessment objectivity, an evaluation system that has not been integrated with real-time operational monitoring also makes it difficult for the organization to detect performance declines quickly. In the aviation industry, delays in identifying operational performance disruptions can have implications for service quality, flight safety, and the effectiveness of airport operational coordination.

Gap Between Administrative and Strategic Indicators

The research found that some of the Key Performance Indicators (KPIs) currently used remain administratively oriented and have not fully supported the strategic needs of a modern airport organization.

Table 2. Existing KPI vs Strategic KPI

Existing KPI Indicators	Strategic KPI Needed
Attendance level	Operational productivity
Work discipline	Service responsiveness
Procedural compliance	Operational safety
Routine task completion	Operational effectiveness
Administrative reporting	Real-time operational monitoring

Based on the table, it can be seen that the majority of assessment indicators remain focused on employee administrative aspects and have not yet optimally measured individual contributions to the achievement of the airport organization's strategic targets.

In a modern airport organization, operational workers should be assessed based on operational service quality, the effectiveness of handling operational disruptions, operational facility readiness, the speed of field coordination, flight safety, and contributions to the achievement of on-time performance. This indicates a gap between the indicators currently used by the organization and the actual operational needs of the airport.

These findings are consistent with the research conducted by Suryanto et al. (2022), which states that administrative performance indicators are no longer sufficient to support organizations with high operational complexity. Research by Kurniawan and Azizah (2023) also shows that modern organizations require strategically based KPIs that are capable of directly linking individual activities to organizational targets.

Integration of Balanced Scorecard, AHP, and OMAX

Based on the evaluation of the appraisal system currently implemented, this study proposes the integration of the Balanced Scorecard, Analytic Hierarchy Process, and Objective Matrix as a model for developing an airport operational performance evaluation system. The integration of these three methods is intended to enhance assessment objectivity, strengthen the linkage between individual indicators and organizational strategy, and support performance monitoring based on real-time operational data.

The Balanced Scorecard approach is used as the primary strategic framework to connect the individual appraisal system with the airport organization's targets. Through this approach, operational performance indicators are divided into four main perspectives: the customer perspective, the financial perspective, the internal business processes perspective, and the learning and growth perspective.

In the customer perspective, assessment indicators focus on operational service quality, flight safety, service speed, and airport user satisfaction. The financial perspective is oriented toward operational cost efficiency and the effective use of organizational resources. The internal business processes perspective encompasses operational coordination effectiveness, facility readiness, and the smooth flow of flight operations. Meanwhile, the learning and growth perspective relates to employee competence, operational training, and the development of human resource capacity.

The use of the Balanced Scorecard in this study demonstrates that the performance evaluation system is no longer oriented solely toward employee administrative aspects but is also directed toward supporting the achievement of the airport organization's strategic objectives. These findings are consistent with the research conducted by Rahmat and Kholis (2022), which states that the implementation of the Balanced Scorecard can enhance the linkage between individual performance and organizational strategy in the public service sector.

Research by Putri et al. (2024) also shows that organizations with evaluation systems based on the Balanced Scorecard tend to have a higher level of performance monitoring effectiveness compared to organizations with conventional administrative appraisal systems.

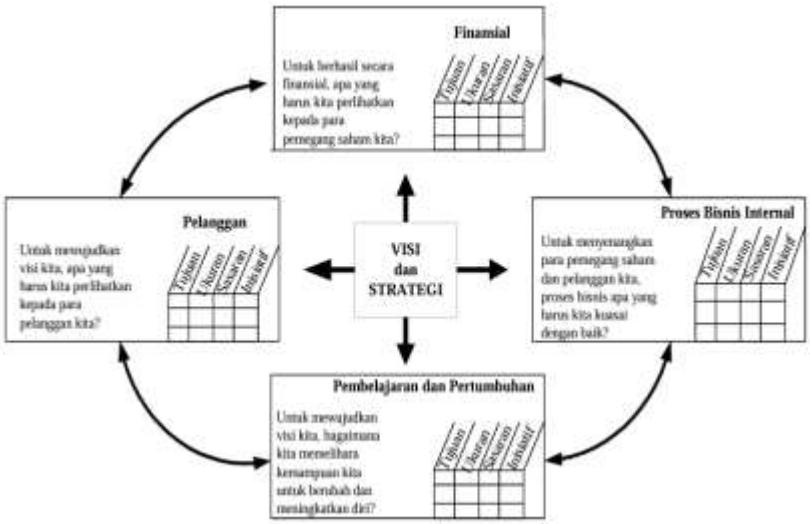

Figure 2. Balanced Scorecard Integration Framework in Airport Operational Performance Assessment

Analytical Hierarchy Process (AHP) Prioritization

Once the strategic perspectives were determined through the Balanced Scorecard approach, this study employed the AHP method to determine the priority level of each assessment indicator based on the strategic importance to the airport organization.

The weighting results indicate that the customer perspective received the highest priority in the airport operational performance evaluation system. This suggests that service quality and operational safety constitute the primary focus in measuring the performance of airport operational workers.

Table 3. Balanced Scorecard Perspective Weighting

Balanced Scorecard Perspective	Priority Weight
Customer Perspective	55.40%
Financial Perspective	19.40%
Internal Business Process	18.20%
Learning and Growth	6.90%

Based on the weighting results, it can be seen that the airport organization places greater emphasis on employee performance in terms of service and operational safety aspects rather than administrative indicators alone. The customer perspective received the highest weight because operational service quality has a direct influence on airport user satisfaction and the continuity of flight operations.

These findings are consistent with the research conducted by Fauzan et al. (2021), which states that the customer perspective serves as the dominant indicator in measuring the performance of transportation service organizations. Research by Harahap and Nugraha (2023) also explains that service quality and operational safety are the primary strategic indicators in the modern aviation industry.

The use of the AHP method in this study is considered capable of helping the organization determine indicator priorities more systematically and rationally. Furthermore, the AHP method also helps reduce the dominance of subjectivity in determining the weighting of performance assessments for airport operational employees.

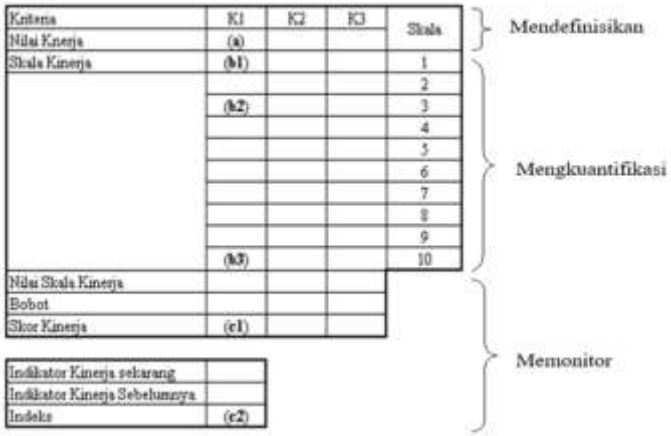

Figure 3. Weighting of Operational Performance Measures at Halim Perdanakusuma Airport Using AHP

Based on the weighting results using the AHP method, the customer perspective obtained the highest weight of 55.40%, indicating that operational service quality and flight safety constitute the primary priorities in the airport operational performance evaluation system.

Objective Matrix (OMAX) Implementation

This study further employs the OMAX method to normalize the measurement of airport operational performance into a single integrated evaluation system. The use of the OMAX method allows indicators with different units of measurement to be standardized, thereby producing a more objective and measurable performance evaluation.

The OMAX method also supports the development of a digital dashboard-based performance monitoring system, enabling the organization to conduct continuous and real-time oversight of operational performance.

Table 4. OMAX Assessment Simulation

Operational KPI	Target	Actual	OMAX Score
On-time performance	85%	80%	7
Operational disruption response	10 minutes	15 minutes	5
Operational facility readiness	95%	92%	8
User service satisfaction	90%	88%	7
Compliance with safety procedures	100%	98%	9

Based on the simulation, the safety procedure compliance indicator achieved the highest score, as its level of achievement was close to the organizational target. Meanwhile, the operational disruption response indicator obtained a lower score, as the handling time still fell below the standard target set by the organization.

Table 5. Total Integrated Performance Score

Perspektif	Bobot AHP	Nilai OMAX	Skor Akhir
Customer Perspective	55.40%	7.8	4.32
Financial Perspective	19.40%	7.0	1.35
Internal Business Process	18.20%	8.1	1.47
Learning and Growth	6.90%	7.5	0.51
Total	100%	-	7.65

The simulation results indicate that the integration of AHP and OMAX is capable of producing a more objective appraisal system compared to the conventional evaluation system based on supervisor subjectivity. Furthermore, the use of a real-time data-based monitoring dashboard enables the organization to conduct performance evaluations more quickly and accurately.

These findings are consistent with the research conducted by Maulana et al. (2022), which states that the use of the OMAX method can improve the effectiveness of organizational performance measurement through the normalization of productivity-based indicators. Another study by Santoso and Permata (2024) also explains that a digital dashboard-based monitoring system can enhance the speed of organizational decision-making in the transportation operational sector.

No	Perspektif Balanced Scorecard	Ukuran Kinerja Operasional	Satuan	Skala Kinerja										
				0	1	2	3	4	5	6	7	8	9	10
1	Finansial	*Operating Ratio*	%	64,25	63,00	62,58	60,50	59,71	58,93	58,14	57,36	56,57	55,79	55,00
		Earning-price ratio	%	56,00	57,33	57,78	60,00	63,57	67,14	70,71	74,29	77,86	81,43	85,00
		Penyerapan investasi	%	80,00	80,67	80,89	82,00	83,14	84,29	85,43	86,57	87,71	88,86	90,00
2	Perspektif	Peralatan navigasi	%	95,00	95,33	95,44	96,00	96,29	96,57	96,86	97,14	97,43	97,71	98,00
		Keamanan	%	92,00	93,00	93,33	95,00	95,43	95,86	96,29	96,71	97,14	97,57	98,00
		Waktu tunggu	menit	22,00	21,33	21,11	20,00	19,86	19,71	19,57	19,43	19,29	19,14	19,00
		Kapasitas terminal	meter	0,96	1,04	1,07	1,20	1,23	1,26	1,29	1,31	1,34	1,37	1,40
		Apron	%	99,00	99,00	99,00	99,00	99,14	99,29	99,43	99,57	99,71	99,86	100,00
3	Bisnis Internal	Kedatangan & keberangkatan pesawat	kali	300,00	327,33	336,44	382,00	386,86	391,71	396,57	401,43	406,29	411,14	416,00
		Kesiapan fasilitas	%	94,00	94,67	94,89	96,00	96,57	97,14	97,71	98,29	98,86	99,43	100,00
		Jam operasi	Jam	12,00	12,00	12,00	12,00	12,29	12,57	12,86	13,14	13,43	13,71	14,00
4	Pertumbuhan dan Pembelajaran	Mutu & kuantitas SDM	orang	41,00	41,33	41,44	42,00	42,43	42,86	43,29	43,71	44,14	44,57	45,00
		Pelatihan Karyawan	orang	20,00	21,33	21,78	24,00	25,14	26,29	27,43	28,57	29,71	30,86	32,00
		Sertifikasi karyawan	orang	18,00	19,33	19,78	22,00	23,14	24,29	25,43	26,57	27,71	28,86	30,00

Figure 4. Airport Operational Performance Monitoring Dashboard Simulation

Proposed Integrated Performance Appraisal Model

This study produces an airport operational performance evaluation model based on the integration of the Balanced Scorecard, AHP, and OMAX as a solution to the various weaknesses in the existing appraisal system.

The novelty (research novelty) of this study lies in the integration of three performance evaluation approaches—namely the Balanced Scorecard, AHP, and OMAX—into a single airport operational performance assessment model, where previously the system still relied on administrative and partial approaches. This integration enables the organization to produce an evaluation system that is more strategic, objective, and based on actual operational data.

The proposed model is developed to enhance evaluation objectivity, strengthen the linkage between individual KPIs and organizational strategy, and support real-time, data-driven decision-making based on operational data.

Table 6. Existing System vs Proposed System

Aspect	Existing System	Proposed System
Evaluation	Subjective FPAL	Data-driven KPIs
Monitoring	Annual	Real-time dashboard
KPI	Administrative	Strategis
Weighting	Not standardized	Using AHP

Aspect	Existing System	Proposed System
Measurement	Manual	OMAX integrated
Evaluation	Superior's perception	Operational data
Performance monitoring	Not continuous	Continuous monitoring
Transparency of assessment	Low	More objective and open

Based on the table, it can be seen that the proposed model offers advantages over the existing system, as it is capable of producing a performance evaluation that is more objective, adaptive, and aligned with the operational needs of a modern airport.

In practical terms, the integration model can assist airport management in enhancing the transparency of employee evaluations, accelerating the operational performance monitoring process, supporting the digitalization of human resource management, and continuously improving service quality and flight safety.

No	Perspektif Balanced Score-card	Ukuran Kinerja Operasional	Satuan	Skala Kerja											Nilai Skala Ukuran	Bobot Global Ukuran	Skor Ukuran Kinerja
				0	1	2	3	4	5	6	7	8	9	10			
1	Finansial	Operating Ratio	%	64.25	63.00	62.58	60.50	59.71	58.93	58.14	57.36	56.57	55.79	55.00	3	0.046	13.8%
		Earning-price ratio	%	56.00	57.33	57.78	60.00	63.57	67.14	70.71	74.29	77.86	81.43	85.00	3	0.017	5.1%
		Penyerapan investasi	%	80.00	80.67	80.89	82.00	83.14	84.29	85.43	86.57	87.71	88.86	90.00	3	0.131	39.3%
2	Perspektif	Peralatan navigasi	%	95.00	95.33	95.44	96.00	96.29	96.57	96.86	97.14	97.43	97.71	98.00	3	0.203	60.9%
		Keamanan	%	92.00	93.00	93.33	95.00	95.43	95.86	96.29	96.71	97.14	97.57	98.00	3	0.194	58.2%
		Waktu tunggu	Menit	22.00	21.33	21.11	20.00	19.86	19.71	19.57	19.43	19.29	19.14	19.00	3	0.022	6.6%
		Kapasitas terminal	Meter	0.96	1.04	1.07	1.20	1.23	1.26	1.29	1.31	1.34	1.37	1.40	3	0.045	13.5%
		Apron	%	99.00	99.00	99.00	99.00	99.14	99.29	99.43	99.57	99.71	99.86	100.00	3	0.089	26.7%
3	Bisnis Internal	Kedatangan & keberangkatan pesawat	kali	30.00	32.73	33.64	38.20	38.66	39.71	39.56	40.14	40.29	41.14	41.60	3	0.048	14.4%
		Kesiapan fasilitas	%	94.00	94.67	94.89	96.00	96.57	97.14	97.71	98.29	98.86	99.43	100.00	3	0.116	34.8%
		Jam operasi	Jam	12.00	12.00	12.00	12.00	12.29	12.57	12.86	13.14	13.43	13.71	14.00	3	0.019	5.7%
4	Pertumbuhan & Pembelajaran	Mutu & kuantitas SDM	Orang	41.00	41.33	41.44	42.00	42.43	42.86	43.29	43.71	44.14	44.57	45.00	3	0.015	4.5%
		Pelatihan Karyawan	Orang	20.00	21.33	21.78	24.00	25.14	26.29	27.43	28.57	29.71	30.86	32.00	3	0.006	1.8%
		Sertifikasi karyawan	Orang	18.00	19.33	19.78	22.00	23.14	24.29	25.43	26.57	27.71	28.86	30.00	3	0.048	14.4%

Figure 5. Balanced Scorecard, AHP, and OMAX Integration Model in the Airport Operational Performance Assessment System

The research results show that the integration of the Balanced Scorecard, AHP, and OMAX can produce a more strategic, objective, and measurable performance evaluation system compared to conventional assessment systems that are still dominated by administrative and subjective approaches. The integration of these three methods enables airport organizations to develop an evaluation system that is more adaptive to the dynamics of modern aviation operations and supports improvements in service quality and flight operational safety.

CONCLUSION

This study was conducted to evaluate the airport operational performance appraisal system implemented at the Halim Perdanakusuma International Airport Operations Service Division and to analyze the development of an evaluation model based on the integration of the Balanced Scorecard, Analytic Hierarchy Process, and Objective Matrix as a more

strategic, objective, and measurable performance measurement approach. The findings indicate that the current performance appraisal system still faces various fundamental problems, particularly the high dominance of subjectivity in the evaluation process of operational employees. The use of the Direct Supervisor Assessment Form (Formulir Penilaian Atasan Langsung – FPAL) as the primary evaluation instrument results in assessment outcomes that remain heavily influenced by supervisors' individual perceptions and are not yet fully supported by actual operational performance data.

Furthermore, the study also found that some of the Key Performance Indicators (KPIs) currently used remain administratively oriented and have not been able to represent the strategic operational needs of a modern airport. Assessments that are overly focused on attendance, administrative discipline, and the completion of routine tasks are considered insufficient to reflect workers' contributions to operational service quality, the effectiveness of handling operational disruptions, facility readiness, flight safety, and the achievement of on-time performance targets. These conditions indicate a gap between the existing evaluation system and the needs of an airport organization that has a high level of operational complexity and operates continuously 24 hours a day.

The results also show that the weakness of the performance monitoring system causes the organization to face limitations in conducting operational oversight quickly and accurately. Evaluations conducted periodically and manually make it difficult for the organization to detect declines in worker performance in real time. In the context of the aviation industry, delays in identifying performance disruptions can have an impact on the effectiveness of operational coordination, service quality for users, and even flight safety. Therefore, an administratively based evaluation system is considered no longer adequate to support the performance management needs of a modern airport.

This study successfully demonstrates that the integration of the Balanced Scorecard, AHP, and OMAX is capable of producing a more strategic and adaptive performance evaluation model compared to conventional assessment approaches. The Balanced Scorecard approach enables the organization to link individual performance indicators with the airport's strategic objectives through four main perspectives: the customer perspective, the financial perspective, the internal business processes perspective, and the learning and growth perspective. This integration ensures that the appraisal system is no longer solely focused on employees' administrative activities but also on their tangible contributions to the organization's overall operational performance.

The AHP method employed in this study also proved capable of helping the organization determine assessment indicator priorities more systematically and rationally. The weighting results indicate that the customer perspective received the highest weight compared to other perspectives, demonstrating that service quality and operational safety are the primary priorities in measuring the performance of airport operational workers. The use of the AHP method is considered able to reduce the dominance of subjectivity in determining assessment weights while simultaneously enhancing the objectivity of the organization's evaluation system.

Furthermore, the OMAX method is used to normalize operational performance measurements into a single integrated evaluation system. The use of this method allows indicators with different units of measurement to be standardized, thereby producing a performance measurement that is more objective, transparent, and easy to monitor continuously. The assessment simulation conducted in this study demonstrates that the integration of AHP and OMAX is capable of producing more accurate performance evaluations compared to the conventional supervisor perception-based appraisal system. In addition, the development of a digital-based monitoring dashboard is also considered capable of supporting faster organizational decision-making based on actual operational data.

The novelty (research novelty) of this study lies in the integration of the Balanced Scorecard, AHP, and OMAX into a single airport operational performance evaluation model, where previously the system still relied on administrative and partial approaches. The integration of these three methods produces an evaluation system that not only functions as an administrative human resource tool but also as a strategic organizational instrument for improving operational effectiveness, service quality, and flight safety. Thus, this study contributes to the advancement of performance management and industrial engineering knowledge, particularly in the air transportation sector, which is characterized by complex and dynamic operational conditions.

Practically, the findings of this study can serve as a foundation for developing an operational performance appraisal system based on digitalization and real-time performance monitoring within airport organizations. The proposed model enables the organization to enhance employee evaluation transparency, accelerate the operational performance monitoring process, strengthen data-driven decision-making, and support the digital transformation of human resource management in the aviation sector. The implementation of a digital dashboard-based evaluation system also has the potential to improve the effectiveness of airport operational coordination and support the continuous improvement of service quality for aviation service users.

Nevertheless, this study still has several limitations. The research was focused solely on the Halim Perdanakusuma International Airport Operations Service Division, so the findings cannot be fully generalized to all airport organizations in Indonesia. Furthermore, the performance monitoring simulation conducted remains conceptual and has not been directly implemented using real-time operational data. Therefore, future research is recommended to implement the integration model comprehensively across various airport operational units and to develop a technology-based evaluation system with real-time analytics, so that the airport operational performance management system can operate more effectively, adaptively, and sustainably.

REFERENCES

Aulia, R., & Prasetyo, D. (2022). Performance appraisal transparency in public sector organizations: Challenges and strategic solutions. Journal of Human Resource Management Studies, 14(2), 88–101. https://doi.org/10.21098/jhrms.2022.14.2.88

Fauzan, M., Hidayat, T., & Ramadhan, F. (2021). Customer-oriented performance measurement in transportation service organizations using Balanced Scorecard approach. International Journal of Industrial Engineering Research, 10(3), 145–156. https://doi.org/10.5267/j.ijier.2021.3.004

Harahap, R., & Nugraha, P. (2023). Strategic operational performance indicators in airport service management. Journal of Air Transport Management, 108, 102356. https://doi.org/10.1016/j.jairtraman.2023.102356

Kaplan, R. S., & Norton, D. P. (2020). The Balanced Scorecard: Translating strategy into action. Harvard Business Review Press.

Kurniawan, A., & Azizah, N. (2023). Strategic KPI transformation in public transportation organizations. Jurnal Teknik Industri, 24(1), 55–67. https://doi.org/10.9744/jti.24.1.55-67

Maulana, F., Setiawan, D., & Hakim, A. (2022). Objective Matrix (OMAX) implementation for operational productivity measurement. International Journal of Productivity and Performance Management, 71(6), 2110–2126. https://doi.org/10.1108/IJPPM-04-2021-0187

Nugroho, H., & Saputra, M. (2021). Real-time monitoring system and organizational performance effectiveness in public services. Jurnal Manajemen Teknologi, 20(3), 189–

201. https://doi.org/10.12695/jmt.2021.20.3.5

Permatasari, D., & Lestari, Y. (2024). Digital transformation of human resource performance management in airport industry. International Journal of Aviation Management, 8(1), 33–47. https://doi.org/10.1504/IJAM.2024.136002

Pratama, R., & Hidayat, S. (2022). Subjectivity bias in employee performance appraisal systems within public organizations. Jurnal Administrasi Publik, 19(2), 102–118. https://doi.org/10.31289/jap.v19i2.2022

Putri, A., Wijayanti, L., & Firmansyah, R. (2024). Balanced Scorecard implementation and organizational performance effectiveness in transportation services. Asian Journal of Management Studies, 15(1), 77–93. https://doi.org/10.5430/ajms.v15n1p77

Rahman, M., Iskandar, R., & Yusuf, H. (2023). Administrative performance indicators and strategic performance gaps in public organizations. Journal of Public Sector Performance, 9(4), 211–226. https://doi.org/10.1177/jpsp.2023.211226

Rahmat, A., & Kholis, N. (2022). Balanced Scorecard integration for strategic organizational alignment in public institutions. Jurnal Sistem Manajemen Kinerja, 11(3), 140–152. https://doi.org/10.26740/jsmk.v11n3.2022

Saaty, T. L. (2020). Decision making with the Analytic Hierarchy Process. Pittsburgh: RWS Publications.

Santoso, B., & Permata, R. (2024). Real-time dashboard implementation for operational monitoring in transportation systems. Journal of Industrial Information Systems, 12(2), 90–104. https://doi.org/10.1080/jiis.2024.120904

Setiawan, R., & Purnama, D. (2023). Performance management digitalization in aviation service organizations. Jurnal Manajemen dan Organisasi, 14(1), 25–39. https://doi.org/10.29244/jmo.v14i1.2023

Suryanto, E., Widodo, H., & Kencana, P. (2022). Strategic performance indicators in high-risk operational organizations. Journal of Industrial and Systems Engineering, 16(2), 166–180. https://doi.org/10.22219/jise.v16i2.2022

Wijaya, A., Firmansyah, M., & Nugraheni, T. (2024). Manual appraisal systems and organizational decision-making delays in operational industries. International Journal of Organizational Analysis, 32(1), 75–91. https://doi.org/10.1108/IJOA-05-2023-3781

Yuliana, S., & Ardiansyah, M. (2021). Airport operational service quality and employee performance measurement systems. Jurnal Transportasi Udara Indonesia, 13(2), 44–58. https://doi.org/10.25104/jtui.v13i2.2021

Zulfikar, M., & Rambe, A. (2025). Integrated performance measurement framework for airport operational management using Balanced Scorecard and AHP. International Journal of Aviation and Aeronautics, 12(1), 55–71. https://doi.org/10.5678/ijaa.2025.12.1.55

Zunaidi, F., Hapsari, L., & Mahendra, R. (2023). Operational productivity evaluation using OMAX method in transportation services. Jurnal Rekayasa Sistem Industri, 12(4), 301–315. https://doi.org/10.26593/jrsi.v12i4.2023