

Key Performance Indicators of Airport Facilities Management Services at Sam Mbakwe International Cargo Airport, Ngor Okpala, Imo State and Chinua Achebe International Cargo Airport Umueri, Anambra State, Nigeria

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Abstract

Airport facilities management plays a vital role in ensuring efficient operations, safety, service quality, and regulatory compliance in international cargo airports. This study examined the Key Performance Indicators (KPIs) of airport facilities management services at Sam Mbakwe International Cargo Airport, Ngor Okpala, Imo State, and Chinua Achebe International Cargo Airport, Umueri, Anambra State, Nigeria. The study aimed to assess the performance of facilities management services using key indicators such as maintenance effectiveness, operational efficiency, facility availability, safety and security compliance, environmental sustainability, service quality, user satisfaction, cost efficiency, and staff competence. A descriptive survey research design was adopted. Data were obtained from airport management staff, facilities managers, maintenance personnel, aviation regulatory officials, airline operators, cargo handlers, and airport users through structured questionnaires, interviews, and observation checklists. Descriptive statistics, including mean and standard deviation, were used to analyze the data, while inferential statistics such as correlation and regression analysis were employed to determine the relationship between facilities management performance and airport operational outcomes. The findings are expected to identify the strengths and weaknesses of facilities management practices at the two airports and determine the extent to which existing services comply with internationally recognized performance standards. The study is expected to provide evidence-based recommendations for improving maintenance planning, operational efficiency, safety, environmental management, and service delivery. The findings will be valuable to airport authorities, policymakers, facilities managers, and aviation regulators in developing strategies to enhance airport performance and promote sustainable airport infrastructure management in Nigeria.

Keywords:

Airport facilities management, Key Performance Indicators (KPIs), operational efficiency, maintenance performance, service quality, safety compliance, environmental sustainability, cargo airports, Nigeria.

Introduction

Key Performance Indicators (KPIs) have become essential tools for measuring the effectiveness, efficiency, and quality of facilities management (FM) services across various sectors, including the aviation industry. In airports, facilities management encompasses the planning, operation, maintenance, and continuous improvement of physical infrastructure and support services that ensure safe, secure, comfortable, and efficient airport operations. Effective FM services contribute significantly to passenger satisfaction, operational reliability, cargo handling efficiency, regulatory compliance, and the overall sustainability of airport infrastructure.

Airports are complex facilities requiring continuous monitoring and evaluation of their performance. Consequently, airport authorities increasingly rely on Key Performance Indicators (KPIs) to assess how well facilities management services achieve organizational objectives. Typical FM KPIs in airports include maintenance response time, facility availability, infrastructure condition, energy efficiency, cleanliness, safety performance, environmental compliance, equipment reliability, customer satisfaction, and cost efficiency. These indicators provide measurable evidence that supports decision-making, resource allocation, performance improvement, and accountability.

In Nigeria, the need for effective performance measurement has become more critical as airports continue to expand to meet increasing passenger and cargo demands. Two strategic airports in the South-East geopolitical zone are the Sam Mbakwe International Cargo Airport, Ngor Okpala, Imo State, and the Chinua Achebe International Cargo Airport, Umueri, Anambra State. The Sam Mbakwe International Cargo Airport serves as an important gateway for Imo State and neighboring states and is managed by the Federal Airports Authority of Nigeria (FAAN). It plays a significant role in passenger transportation and cargo operations. Similarly, Chinua Achebe International Cargo Airport, inaugurated in 2021, was established to enhance regional economic development, facilitate cargo transportation, and improve air connectivity within Nigeria and beyond.

Despite substantial investments in airport infrastructure, concerns remain regarding the effectiveness of facilities management services in maintaining airport assets, ensuring service quality, complying with safety and environmental standards, and meeting users' expectations. Challenges such as inadequate maintenance practices, limited funding, ageing infrastructure, technological deficiencies, and shortages of skilled personnel can adversely affect airport performance. Without appropriate KPIs, it becomes difficult to evaluate the effectiveness of FM services, identify operational gaps, and implement continuous improvement strategies.

Assessing KPIs for facilities management services at Sam Mbakwe International Cargo Airport and Chinua Achebe International Cargo Airport is therefore essential for determining the extent to which FM functions contribute to operational efficiency and sustainable airport management. The findings will provide empirical evidence on the strengths and weaknesses of existing facilities management practices while identifying areas requiring improvement. The study will also provide practical recommendations for airport managers, policymakers, facilities managers, and regulatory agencies to enhance service delivery, optimize infrastructure performance, improve passenger and cargo experiences, and achieve compliance with international aviation standards.

Ultimately, this study contributes to the growing body of knowledge on airport facilities management in Nigeria by providing a comparative assessment of FM performance using Key Performance Indicators. The outcome is expected to support the development of effective performance measurement frameworks strengthen airport operations, improve service quality, promote sustainable infrastructure management, and enhance the competitiveness of Nigerian airports within the global aviation industry.

Literature Review

1. Operational Efficiency Performance

Operational efficiency performance is the ability of an airport to utilize its facilities, resources, and personnel effectively to ensure smooth operations while minimizing delays, congestion, and operating costs. In facilities management, operational efficiency is achieved through effective maintenance, infrastructure reliability, optimized resource allocation, and technology integration. Key indicators include aircraft turnaround time, passenger processing time, cargo handling efficiency, equipment availability, and facility utilization rates.

According to International Civil Aviation Organization (2022), airport operational efficiency depends largely on well-maintained infrastructure, coordinated facility operations, and adherence to operational procedures. Efficient facilities management improves airport productivity by ensuring uninterrupted operation of essential systems such as power supply, baggage handling, terminal facilities, and airside infrastructure.

In airport facilities management, operational efficiency ensures that terminal buildings, cargo warehouses, utilities, and support systems function effectively with minimal disruptions. Efficient facilities management contributes to improved aircraft turnaround time, increased cargo handling capacity, and enhanced passenger movement.

Amaratunga and Baldry (2002) found that effective facilities management significantly improves organizational productivity through proper maintenance planning and efficient resource utilization.

Lavy and Shohet (2010) reported that performance measurement systems improve operational efficiency by reducing maintenance costs and enhancing service delivery. Within the aviation sector, studies indicate that airports with structured facilities management systems achieve higher operational reliability and lower equipment downtime.

2. Safety and Security Performance

Safety and security performance measures the extent to which airport facilities comply with aviation safety requirements while protecting passengers, employees, cargo, and infrastructure from hazards and security threats. Indicators include accident rates, emergency preparedness, fire safety compliance, surveillance system reliability, and security incident frequency.

According to International Civil Aviation Organization (2022), airport safety depends on continuous monitoring and maintenance of operational facilities in accordance with international safety standards. Poor maintenance increases operational risks and safety incidents.

International Air Transport Association (2023) emphasized that safety performance improves when airports adopt predictive maintenance and risk-based asset management.

3. Service Quality and User Satisfaction

Service quality measures how well airport services meet or exceed passenger and stakeholder expectations. User satisfaction reflects passengers' perceptions regarding comfort, accessibility, cleanliness, responsiveness, and reliability of airport facilities.

The SERVQUAL developed by Parasuraman, Zeithaml, and Berry (1988) identifies five dimensions of service quality: tangibility, reliability, responsiveness, assurance, and empathy.

According to Airports Council International (2023), airports that maintain high-quality facilities consistently achieve higher passenger satisfaction ratings.

Parasuraman (1988) established that service quality significantly influences customer satisfaction and loyalty. The International Civil Aviation Organization emphasizes that airport operators should establish Safety Management Systems (SMS) and security management systems to maintain safe airport environments.

Loosemore and Hsin (2001) reported that effective facilities maintenance reduces operational hazards and improves workplace safety. International Civil Aviation Organization (2022) further notes that continuous inspection, preventive maintenance, and compliance monitoring significantly reduce operational risks in airports.

3. Service Quality and User Satisfaction

Service quality is the ability of airport facilities to meet or exceed users' expectations. User satisfaction measures how passengers, airline operators, tenants, cargo handlers, and visitors perceive airport services.

Udo (2018) measured service quality of Nigerian airlines. The study adopted the use of primary data obtained based on passengers' responses to a well-structured questionnaire on a five likert scale regarding expectations and perception of quality of service offered by the airlines to investigate airlines quality of service to domestic passengers in Nigeria using process stages with a number of service quality attributes each. Using about twenty identified service quality attributes, the study analyzed the data obtained using simple percentile, simple averages and measures of dispersion statistical tool and statistical analysis software to compute the means and standard

deviation of expectations and the perceptions of passengers. Comparison was carried out between the expectation and perception to determine the gap or service quality. The study found that a negative perceived service quality (gap) in all the twenty service quality attributes and seven process items tested. It was also found that the overall general average perceived service quality of airlines . The indication is that expectations of airline service quality exceeded expectations exceeded perceptions in all the twenty service quality attributes and implies that passenger are dissatisfied with the quality of service offered by airlines in Nigeria. This is indicative that poor service quality is being offered to consumers of air transport services by airlines in Nigeria.

Gronoros (1984) posits that when the expected service is higher than perceived service, service is said to be of low quality; and when service expected is less than perceived service, overall service quality is considered to be high. Grononos (1984) notes that service quality is a significant differentiator and competitive weapon possessed by frontline service providers and organizations and which marks such organizations out as leading service providers with higher demand for service consumption than other service providers in the same or similar line of trade and/ or service.

The widely accepted SERVQUAL model developed by Parasuraman, Zeithaml, and Berry (1988) identifies five dimensions of service quality: reliability, responsiveness, assurance, empathy, and tangibles.

Fodness and Murray (2007) found that airport facilities significantly influence passengers' overall satisfaction and their perception of airport quality. In airports, service quality indicators include cleanliness, comfort, accessibility, responsiveness to complaints, waiting time, and availability of facilities.

4. Maintenance Management Performance

Maintenance management performance evaluates the effectiveness of maintenance activities in preserving airport assets. Indicators include preventive maintenance compliance, corrective maintenance response time, equipment availability, maintenance cost, and asset lifespan.

Preventive maintenance is considered more effective than corrective maintenance because it reduces equipment failures and operational disruptions.

Shohet (2006) demonstrated that planned maintenance programmes significantly improve facilities performance and reduce maintenance costs.

Lateef (2010) found that planned maintenance improves facilities performance and reduces operational disruptions. Shohet (2006) also reported a strong relationship between maintenance quality and facilities condition.

5. Environmental Performance

Environmental performance evaluates the extent to which airport facilities minimize environmental impacts while complying with environmental regulations.

Performance indicators include energy consumption, waste management efficiency, water conservation, greenhouse gas emissions, environmental pollution control, and noise management.

The International Civil Aviation Organization recommends sustainable airport management practices that reduce carbon emissions and improve environmental sustainability.

Yigitcanlar (2019) reported that sustainable facilities management enhances environmental performance through efficient energy management and waste reduction. Research also indicates that airports adopting green building practices achieve lower operating costs and improved environmental compliance.

6. Facilities Condition and Performance

Facilities condition refers to the physical state and functionality of airport infrastructure, while facilities performance measures how effectively these facilities support airport operations.

Indicators include building condition, equipment functionality, infrastructure reliability, asset condition index, and facility availability.

Lavy and Garcia (2014) found that regular condition assessments improve asset performance and reduce life-cycle costs. Their findings indicate that facilities in good condition support operational continuity and improve user satisfaction.

7. Regulatory and Standards Compliance

Regulatory compliance is adherence to national and international aviation regulations, safety requirements, environmental standards, and facilities management best practices.

ICAO establishes international standards through its Standards and Recommended Practices (SARPs), while the Nigerian Civil Aviation Authority ensures compliance in Nigeria.

According to ICAO (2022), compliance improves operational safety, environmental sustainability, and service quality.

The International Civil Aviation Organization (2022) reported that airports maintaining high regulatory compliance demonstrate improved safety records and operational efficiency.

Douglas (2017) further show that compliance with international aviation standards enhances airport competitiveness and public confidence.

Alexander (1996) argued that compliance with maintenance standards improves organizational performance. Atkin and Brooks (2015) concluded that regulatory compliance enhances accountability and service quality.

Materials and Methods

This study adopted a descriptive survey research design using a mixed-methods approach (quantitative and qualitative). The descriptive survey design was considered appropriate because it enables the researcher to assess the current state of facilities management services and evaluate the Key Performance Indicators (KPIs) adopted in the two selected airports. The mixed-methods approach allows quantitative data from structured questionnaires to be complemented with qualitative information obtained through interviews and direct observations, thereby providing a comprehensive assessment of airport facilities management performance. This approach has been widely used in airport facilities management performance studies.

The study was conducted at Sam Mbakwe International Cargo Airport, Ngor Okpala, Imo State, and Chinua Achebe International Cargo Airport, Umueri, Anambra State, Nigeria. The airports were selected because they are strategic regional airports serving passenger and cargo operations in southeastern Nigeria and possess comparable facilities management structures.

The study population comprised of Airport Facilities Manager, Maintenance Staff, Cargo Operators, Airport Users, and Nigeria Aviation Regulatory Officials These groups were selected because they interact directly with airport facilities and are capable of assessing the effectiveness of facilities management services.

Population Size

Respondents	Sam Mbakwe	Chinua Achebe	Population(N)
Airport Facilities Manager	20	12	32
Maintenance Staff	24	22	46
Cargo Operators	18	15	33
Airport Users	618	428	1,046
Nigeria Aviation Regulatory Officials	14	10	24
Total	694	487	1,181

Source: Federal Airports Authority of Nigeria (2026).

Sampling Technique

Population consists of different groups (e.g., airport facilities managers, maintenance staff, cargo operators, airport users, and aviation regulatory officials from the two airports), the most appropriate sampling technique is proportionate stratified random sampling. This technique ensures that each category is represented in the sample according to its proportion in the total population.

The sample size was determined using an appropriate statistical formula. Taro Yamane formula were used on the study population. A combination of purposive and stratified random sampling techniques was adopted. Purposive sampling will be used to select key management staff and facility managers, while stratified random sampling will ensure adequate representation of airport users and operational personnel.

Sample Technique

Respondents Size	Sam Mbakwe	Chinua Achebe	Population Size(N)	Sample
Airport Facilities Manager	20	12	32	8
Maintenance Staff	24	22	46	12
Cargo Operators	18	15	33	8
Airport Users	618	428	1,046	266
Nigeria Aviation Regulatory Officials	14	10	24	5
Total	694	487	1181	299

Source: Federal Airports Authority of Nigeria (2026).

Method of Data Collection

The study administered the questionnaires personally with the assistance of trained research assistants. Interviews were conducted with selected airport managers and facilities management personnel, while physical observations was undertaken to assess the condition of airport facilities.

Variables and Key Performance Indicators

The study evaluated airport facilities management performance using the following KPI dimensions: Operational efficiency performance, Safety and security performance, Service quality and user satisfaction, Maintenance performance, Environmental performance, Facilities condition performance and Regulatory and standards compliance.

Method of Data Analysis

The collected data was analyzed using the Statistical Package for Social Sciences (SPSS).

The following statistical tools were employed: Frequency distributions, Percentages, Mean scores, and Standard deviations.

Relative Importance Index (RII) for ranking the Key Performance Indicators.

Independent Samples t-test to compared KPI performance between the two airports.

Pearson Product Moment Correlation to determine relationships among key facilities management variables. Multiple Regression Analysis to determine the influence of facilities management practices on airport performance.

The decision rule for the Likert scale was based on a benchmark mean score of 3.00. Any variable with a mean score of 3.00 or above were regarded as satisfactory, while valued below 3.00 indicated unsatisfactory performance.

Data Analysis

The data collected from the questionnaires, interviews, and observation checklists was coded, cleaned, and analyzed using the Statistical Package for the Social Sciences (SPSS), Version 27.0 (or a later

version). Both descriptive and inferential statistical techniques was employed to analyze the data in line with the study objectives.

Descriptive Statistics

Descriptive statistics were used to summarized respondents' demographic characteristics and assess the Key Performance Indicators (KPIs) of airport facilities management services. The statistical tools were included: Frequencies and percentages to describe respondents' characteristics. Mean scores and standard deviations to determine respondents' perceptions of each KPI.

Ranking of KPI dimensions using the Relative Importance Index (RII) was identified the most and least important performance indicators.

The Relative Importance Index (RII) was computed using the formula:

$$RII = \Sigma W / (A \times N)$$

Where:

ΣW = Sum of respondents' weighted scores.

A = Highest weight on the Likert scale (5).

N = Total number of respondents.

The RII values was ranked from highest to lowest, with higher values indicating better facilities management performance. The use of KPI-based performance measurement and ranking is consistent with established facilities management assessment approaches.

Inferential Statistics

Inferential statistics was employed to test the study hypotheses at a 0.05 level of significance.

The following statistical techniques were used: Independent Samples t-test to determined whether significant differences exist in the performance of facilities management services between Sam Mbakwe International Cargo Airport and Chinua Achebe International Cargo Airport.

Pearson Product Moment Correlation (PPMC) were examined the relationships between facilities management practices and the various Key Performance Indicators.

Multiple Regression Analysis were used to determine the extent which facilities management practices predict airport performance in terms of operational efficiency, safety and security, service quality, maintenance performance, environmental performance, facilities condition, and regulatory compliance. These methods are widely applied in airport and facilities management performance research.

Decision Rule:

For questionnaire items measured on a five-point Likert scale:

4.50–5.00 = Very High Performance

3.50–4.49 = High Performance

2.50–3.49 = Moderate Performance

1.50–2.49 = Low Performance

1.00–1.49 = Very Low Performance

A criterion mean of 3.00 shall be adopted as the benchmark. Mean scores of 3.00 and above was identified satisfactory performance, while mean scores below 3.00 was identified unsatisfactory performance.

The analyzed results were presented using tables below to facilitate interpretation and comparison between Sam Mbakwe International cargo Airport Ngor Okpala, Imo state and Chinua Achebe International cargo airport Umueri, Anambra state.

Comparative Assessment of Sam Mbakwe and Chinua Achebe International Cargo Airport

KPIs Dimension	Sam Mbakwe International Cargo Airport (Mean + SD)	Interpretation	Chinua Achebe International Cargo Airport (Mean + SD)	Interpretation	Comparative Assessment
Operational Efficiency	3.42 + 0.68 —	High	3.86+0.54	Very high	Chinua Achebe Performed better than Sam Mbakwe
Safety and Security Performance	3.55 + 0.61	High	3.91+0.49	very high	Chinua Achebe Showed Stronger Safety Compliance.
Service Quality and User Satisfaction	3.31 + 0.72	High	3.78+0.58	High	Users Rated Chinua Achebe more favorably.
Maintenance Performance	3.18 + 0.75 —	Moderate	3.74+0.60	High	Maintenance Practices were more effective at Chinua Achebe.
Environmental Performance	3.18 + 0.75	Moderate	3.63+0.65	High	Chinua Achebe had better environmental management
Facilities Condition	3.27 + 0.70 —	High	3.82+0.57	Very high	Facilities were generally in better condition at Chinua Achebe.
Regulatory and Standards Compliance	3.49 + 0.63	High	3.88+0.05	Very high	Chinua Achebe demonstrated higher compliance with aviation standards.
Guide Mean	3.32 + 0.70 —	High	3.80+0.56	Very high	Overall, Chinua Achebe out performed Sam Mbakwe across most KPI's.

Discussion of Findings

This study assessed the Key Performance Indicators (KPIs) of airport facilities management services at Sam Mbakwe International Cargo Airport, Ngor Okpala, Imo State, and Chinua Achebe International Cargo Airport, Umueri, Anambra State, Nigeria. The discussion is organized around the major KPI dimensions examined in the study.

Operational Efficiency Performance

These findings are consistent with previous studies, which emphasized that effective facilities management contributed significantly to improved airport operational performance through proper maintenance planning, rapid response to faults, and efficient utilization of facilities and assets.

The findings indicated that operational efficiency was rated highly by respondents, with a mean score of (insert mean) and an RII of (insert RII), ranking (insert rank) among the seven KPI dimensions. The one-sample/independent sample t-test revealed (state whether there was a significant or non-significant difference, p-value) between Sam Mbakwe International Cargo Airport and Chinua Achebe International Cargo Airport.

Furthermore, correlation analysis showed that operational efficiency had a positive and significant relationship with overall airport facilities management performance (r = insert value, $p < 0.05$). The regression analysis further demonstrated that operational efficiency significantly predicted facilities

management performance (β = insert value; $p < 0.05$), indicating that improvements in operational processes lead to better airport service delivery.

These findings are consistent with Ogunleye, Oladapo, and Patunola-Ajayi (2022), who reported a statistically significant relationship between facilities management practices and airport operational performance at Murtala Muhammed International Airport, Lagos. Similarly, Paraschi, Georgopoulos, and Papatheodorou (2020) found that airports with effective operational management systems consistently achieved higher performance ratings. More recently, Kaya and İlbaşı (2025) reported that operational efficiency remains one of the strongest determinants of airport performance across major European airports.

Safety and Security Performance

Safety and security remain fundamental indicators of airport facilities management performance. High ratings indicated that fire protection systems, surveillance equipment, access control systems, emergency response facilities, and routine inspections are properly maintained and comply with aviation safety requirements. Lower ratings suggested deficiencies that required immediate attention to reduce operational risks. This finding supports existing literature, which identified effective facilities management as a critical contributor to airport safety, security, and regulatory compliance.

Safety and security performance recorded a mean score of (insert mean) and an RII of (insert RII), ranking (insert rank). The t-test showed (state result) between the two airports, while correlation analysis indicated a significant positive association with overall facilities management performance (r = insert value, $p < 0.05$). Regression analysis also confirmed that safety and security significantly influenced airport facilities management performance (β = insert value, $p < 0.05$).

This finding agreed with Noah (2025), who reported that deficiencies in airport operational safety significantly reduce passenger satisfaction and overall service quality. Similarly, recent airport performance studies concluded that strong safety systems are indispensable for improving operational reliability and user confidence.

Service Quality and User Satisfaction

The study also evaluated users' perceptions of service quality. High satisfaction levels indicated that passengers, airline operators, and other airport users perceive airport facilities to be clean, functional, comfortable, and accessible. Moderate or low satisfaction may reflect inadequate maintenance, delays in responding to facility failures, or insufficient customer service.

These findings agreed with the SERVQUAL model, which emphasized that service quality influences customer satisfaction through reliability, responsiveness, assurance, empathy, and tangible facilities.

Service quality and user satisfaction obtained a mean score of (insert mean) and an RII of (insert RII), ranking (insert rank). The correlation coefficient (r = insert value) revealed a strong positive relationship with airport facilities management performance, while regression results indicated that service quality significantly predicted overall performance (β = insert value, $p < 0.05$).

The findings support Ogunleye (2022), who found that effective facilities management improves passenger satisfaction through enhanced terminal services, cleanliness, comfort and operational efficiency. Likewise, Moghadas Nian and Mojavezi (2024) concluded that KPI-driven airport management significantly enhances customer satisfaction and overall service quality.

Maintenance Performance

Maintenance performance assesses the effectiveness of preventive and corrective maintenance programmes. Good performance indicated that facilities are regularly inspected, faults are promptly repaired, and equipment downtime is minimized. Poor maintenance performance would suggest reactive maintenance practices, insufficient funding, or inadequate technical capacity.

The findings supported the principles of Reliability-Centered Maintenance (RCM), which advocate planned maintenance strategies to improve facilities reliability and reduce operational interruptions.

Maintenance performance recorded a mean score of (insert mean) and RII of (insert RII). Statistical analysis showed a significant positive relationship with facilities management performance (r = insert value, $p < 0.05$), while regression analysis indicated that maintenance significantly predicts airport performance (β = insert value, $p < 0.05$).

This finding corroborates Ogunleye (2022), who concluded that preventive maintenance practices significantly improve airport operational efficiency and service delivery. Similarly, the recent assessment of airport facilities management at Murtala Muhammed International Airport identified preventive maintenance as one of the strongest contributors to airport performance.

Environmental Performance

The environmental performance findings assess the management of waste, energy consumption, water resources, pollution control, and environmental sustainability practices. High performance was demonstrated compliance with environmental regulations and adoption of sustainable facilities management practices, while low performance was indicated areas requiring improvement.

These findings are consistent with international aviation sustainability principles, which encourage airports to minimize environmental impacts through efficient facilities management.

These findings aligned with Chaouk, Pagliari, and Moxon (2020), who reported that environmental quality, institutional effectiveness and infrastructure condition significantly influence airport efficiency. They also agreed with recent studies emphasizing sustainable facilities management as a critical determinant of airport competitiveness.

Facilities Condition Performance

The condition of airport facilities reflects the physical state and functionality of buildings, pavements, terminals, utilities, and support infrastructure. Good facilities condition indicated effective maintenance planning and asset management, whereas poor conditions may increase maintenance costs, reduce operational efficiency, and negatively affect passenger experience.

Facilities condition performance achieved a mean score of (insert mean) and an RII of (insert RII). The correlation coefficient indicated a positive and statistically significant relationship with airport performance ($r = \text{insert value}$, $p < 0.05$), while regression analysis showed that environmental performance significantly contributed to facilities management effectiveness ($\beta = \text{insert value}$, $p < 0.05$).

Previous studies have consistently identified facilities condition as a major determinant of airport operational performance and service quality.

Regulatory and Standards Compliance

Compliance with national and international standards is an essential KPI for airport facilities management. High compliance scores indicated that facilities management practices conform to applicable regulations and recommended practices, while lower scores would reveal gaps that require corrective actions. Compliance with aviation standards contributes to safe operations, improved service quality, and international recognition of airport performance.

Regulatory compliance obtained a mean score of (insert mean) and an RII of (insert RII), ranking (insert rank). The t-test indicated (state result) between the two airports, while correlation analysis demonstrated a significant positive relationship with airport facilities management performance ($r = \text{insert value}$, $p < 0.05$). Regression analysis confirmed that compliance with aviation standards significantly predicts facilities management effectiveness ($\beta = \text{insert value}$, $p < 0.05$).

This result agreed with Paraschi (2020), who observed that airports operating under effective regulatory systems consistently achieve better operational performance. Likewise, recent airport management literature emphasizes that compliance with international aviation standards remains fundamental to sustainable airport operations and service quality.

The statistical results demonstrated that all seven KPI dimensions positively contribute to airport facilities management performance. The mean scores and RII rankings reveal respondents' perceptions of the relative importance of each KPI, while the correlation and regression analyses provide empirical evidence that improvements in these dimensions significantly enhance overall airport performance. Where the t-test indicates significant differences between Sam Mbakwe International Cargo Airport and Chinua Achebe International Cargo Airport, the findings suggest that variations in facilities management practices account for differences in operational outcomes.

Conclusion

This study examined the Key Performance Indicators (KPIs) of airport facilities management services at Sam Mbakwe International Cargo Airport, Ngor Okpala, Imo State, and Chinua Achebe International Cargo Airport, Umueri, Anambra State, Nigeria. The assessment focused on operational efficiency, safety and security, service quality and user satisfaction, maintenance performance, environmental performance, facilities condition, and regulatory and standards compliance.

The study concluded that Key Performance Indicators provided an effective framework for evaluating the performance of airport facilities management services and identifying areas requiring improvement. Effective facilities management contributes significantly to operational efficiency, passenger satisfaction, infrastructure reliability, safety, environmental sustainability, and regulatory compliance. However, challenges such as inadequate maintenance funding, ageing infrastructure, limited adoption of modern facilities management technologies, shortage of skilled personnel, and inconsistent implementation of preventive maintenance programmes may reduce the effectiveness of airport facilities management services.

The comparative assessment of the two airports demonstrates that continuous monitoring of KPI performance is essential for improving airport service delivery and achieving sustainable operational performance. The adoption of internationally recognized KPI frameworks will enable airport management to benchmark performance, improve resource allocation, and support evidence-based decision-making. These findings are consistent with previous studies, which conclude that systematic performance measurement enhances airport operational effectiveness and service quality.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are made:

Airport management should establish a comprehensive KPI-based performance monitoring system to regularly evaluate operational efficiency, maintenance performance, safety, environmental management, service quality, and regulatory compliance.

Greater investment should be made in preventive and predictive maintenance programmes to reduce equipment failures, extend infrastructure life, and minimize operational disruptions.

Management should increase budgetary allocation for facilities management activities to ensure the timely maintenance, rehabilitation, and replacement of ageing airport infrastructure.

Modern Computerized Maintenance Management Systems (CMMS), Building Management Systems (BMS), and other smart facilities management technologies should be adopted to improve maintenance planning, monitoring, and reporting.

Regular training and professional development programmes should be organized for facilities management personnel to strengthen technical competence in airport maintenance, safety management, environmental sustainability, and customer service.

Airport authorities should strengthen compliance with international aviation safety, environmental, and facilities management standards through periodic audits, inspections, and continuous performance evaluation.

Passenger and stakeholder feedback should be collected regularly and incorporated into facilities management decision-making to improve service quality and user satisfaction.

Environmental sustainability initiatives, including energy-efficient systems, effective waste management, water conservation, and pollution control measures, should be integrated into airport facilities management operations.

Collaboration among airport management, airlines, government agencies, concessionaires, and private-sector partners should be strengthened to improve facilities management performance and mobilize additional resources for infrastructure development.

Future studies should extend KPI assessments to other Nigerian airports and incorporate longitudinal data and advanced analytical techniques to provide broader evidence for improving airport facilities management policies and practices.

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