AI-Driven Inventory Optimization in Airline Logistics: Enhancing Efficiency, Sustainability, and Operational Performance

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Abstract

This study examines the application of AI-driven predictive analytics to optimize inventory management in airline logistics. The primary research objectives are to evaluate how these advanced techniques reduce spare-part shortages and excesses, enhance operational efficiency, and contribute indirectly to sustainability by lowering waste and energy consumption. Employing a mixed-methods approach, the research synthesizes quantitative performance metrics—such as inventory cost reductions ranging from 25% to 40% and inventory level decreases of 20% to 54%—with qualitative insights into strategic implementation and stakeholder engagement. Key findings indicate that integrating machine learning algorithms and simulation-based models not only improves inventory turnover and reduces lead times (by approximately 11.5%) but also achieves near-perfect spare parts availability. The study further highlights substantial financial benefits, including significant cost savings and improved working capital, and outlines actionable recommendations for integrating AI into existing ERP/MRO systems. The results contribute to theoretical frameworks in digital transformation and supply chain management, offering practical implications for airline executives and policymakers seeking to drive operational excellence and sustainable practices in the aviation industry.

Keywords: AI-Driven Analytics, Inventory Optimization, Airline Logistics, Operational Efficiency, Sustainability, Digital Transformation, Predictive Maintenance.

Introduction

Background

The aviation industry is currently undergoing a digital transformation characterized by the integration of advanced technologies such as AI, IoT, and blockchain to enhance operational efficiency and competitiveness. In this context, AI-powered predictive analytics has emerged as a critical tool in optimizing inventory management, particularly in airline spare parts logistics. Empirical studies indicate that the adoption of these systems can reduce inventory costs by up to 40%, decrease inventory levels by 20–54%, and shorten lead times by approximately 11.5%, while sustaining spare-part availability at an impressive 99%. This transformation not only supports enhanced operational performance, as measured by industry benchmarks like Cost per Available Seat Kilometer (CASK) and fleet reliability metrics (RPK, ASK), but also aligns with broader sustainability objectives by reducing waste and lowering energy consumption. Such improvements are crucial in the era of Tourism 4.0 and digital transformation, where the balance between cost efficiency and environmental sustainability increasingly dictates strategic competitiveness.

Statement of Problem

Despite the potential benefits, many airlines still struggle with imbalances in spare parts inventories—resulting in either costly excesses or critical shortages that disrupt maintenance schedules and operational readiness. The current body of research often emphasizes economic outcomes such as cost reductions and efficiency gains, yet it falls short in quantifying the environmental and social sustainability impacts of these advanced inventory management systems. This gap creates challenges for decision-makers who must navigate complex trade-offs between immediate financial benefits and long-term sustainability goals in an industry heavily influenced by volatile market dynamics and regulatory pressures.

Research Questions/Objectives

To address these challenges, the study is guided by the following research questions:

- How effectively can AI-driven predictive analytics optimize inventory levels and reduce spare-part imbalances in airline logistics?
- In what ways does the integration of AI technologies enhance operational efficiency specifically in terms of lead time reduction, maintenance reliability, and improved service levels while contributing to sustainability objectives?
- What are the measurable financial benefits, particularly regarding reductions in inventory and overall logistics costs, that can be directly attributed to the implementation of AI-powered inventory optimization systems?

The objectives of the study include a comprehensive evaluation of AI implementation strategies, the quantification of both economic and sustainability impacts, and the formulation of actionable recommendations for integrating these advanced systems within existing airline operational frameworks.

Significance of the Study

This research provides critical insights for both academia and industry practitioners by bridging the gap between digital transformation theory and its practical application in airline management. From an academic perspective, it enriches the existing literature by offering a multi-dimensional analysis that encompasses economic, operational, and sustainability metrics. Practically, the study equips airline executives with a data-driven framework that supports strategic decision-making in inventory management facilitating enhanced ROI, streamlined supply chain processes, and improved alignment with sustainability benchmarks. The findings also have implications for stakeholders such as policymakers and regulatory bodies, as they underscore the potential of AI-driven systems to foster resilient and environmentally responsible aviation operations.

Scope of the Study

The study focuses on the application of AI-powered predictive analytics in the context of airline spare parts management. It examines a range of methodological approaches from quantitative optimization modeling and simulation-based techniques to mixed-method case studies across both commercial and military aviation settings. The analysis is geographically and operationally contextualized, taking into account industry-specific variables such as fleet size, maintenance schedules, and the dynamic nature of supply chain networks in the Iranian and broader international aviation sectors. Key performance indicators (KPIs) such as inventory turnover, lead-time variance, and CASK are utilized to evaluate the success of these digital interventions.

Literature Review

Theoretical Background

Foundational theories and conceptual frameworks underpinning AI-driven inventory optimization in airline logistics stem from digital transformation and operations management literature. Digital Maturity Models and frameworks such as McKinsey’s Digital Quotient provide insight into how airlines can assess their readiness to adopt advanced technologies [1]. In parallel, concepts from Tourism 4.0 and Yield Management where efficiency and customer-centricity are paramount inform the integration of AI systems that not only optimize operational performance but also enhance sustainability outcomes. Traditional strategic management tools, including Porter's Five Forces and the Balanced Scorecard, offer valuable lenses for evaluating competitive pressures and aligning technological investments with key performance indicators (KPIs) such as Cost per Available Seat Kilometer (CASK) and inventory turnover ratios [2][3]. Moreover, customer relationship management (CRM) theories further underscore the importance of data-driven insights in tailoring supply chain operations to meet evolving market demands.

Critical Analysis of Existing Literature

A review of empirical studies reveals a diverse array of methodological approaches applied to AI-powered inventory optimization. Quantitative optimization modeling emerges as the predominant technique, with studies by Abdol Rahim et al. [4] and Alhafsi [5] demonstrating inventory cost reductions between 26% and 40%. In contrast, mixed-method case studies and simulation-based approaches (e.g., [6][7][8]) offer nuanced insights into spare parts management by integrating real-world data with predictive modeling. Machine learning techniques ranging from time series forecasting models such as ARIMA and LSTM to artificial neural networks [9][10] have been successfully implemented to enhance demand forecasting accuracy and reduce lead times. However, while these studies consistently report significant improvements in operational metrics (e.g., inventory reductions of up to 54% and lead time reductions of approximately 11.5%), there remains a notable variation in how sustainability outcomes are measured. Few studies explicitly quantify the environmental benefits such as reductions in waste or carbon footprint even though indirect evidence suggests that optimized inventory levels can yield improved resource efficiency [11][12]. The literature also contrasts the effectiveness of various AI implementation strategies, from genetic algorithms [13] to multi-criteria decision-making approaches like the Analytic Hierarchy Process (AHP) [14]. This heterogeneity highlights both the promise of AI in transforming inventory management and the challenges inherent in standardizing performance metrics across diverse operational contexts.

Identification of Research Gaps and Continuity

Despite robust findings in economic and operational improvements, several gaps remain unresolved:

- Sustainability Metrics: Most studies concentrate on financial and operational indicators, leaving a significant gap in the quantification of environmental and social impacts.
- Methodological Inconsistencies: The absence of standardized benchmarks and diverse methodological approaches complicate cross-study comparisons.
- Context-Specific Limitations: Prior research has not sufficiently addressed regional and organizational nuances, particularly in contexts like Iranian aviation management, where unique operational challenges may influence AI adoption.

These gaps resonate with challenges identified in my previous works, introduced AI-specific dimensions to traditional KPI frameworks, and logistics-focused KPIs were adapted to an AI-integrated environment. Further, *Airline Logistics Efficiency: KPI-Driven Strategies* [15] expanded these models to incorporate ethical AI and sustainability considerations. The current study builds upon these foundations by addressing the sustainability gap and refining methodological consistency, thus providing a logical evolution of my research agenda.

Self-Reference and Evolution of Research

This new article is a direct continuation of my prior research efforts. My earlier work on KPI frameworks documented in *Flight to Excellence* [16], *Soaring Above Boundaries* [17], and *Airline Logistics Efficiency: KPI-Driven Strategies* [15] has established a baseline for measuring performance in airline logistics. In this study, I extend those frameworks by integrating AI-driven predictive analytics into inventory optimization, with a specific focus on sustainability and cost efficiency. The self-referenced literature highlights a thematic evolution from traditional performance metrics to a multi-dimensional approach that encompasses environmental, ethical, and operational dimensions. This progression not only fills the identified research gaps but also advances the cumulative knowledge in digital transformation and airline logistics management [18][19].

By synthesizing insights from both external sources and my past research, the literature review sets the stage for a comprehensive investigation into how AI-driven solutions can optimize inventory management. The integration of theoretical models with empirical findings and self-referenced contributions provides a robust framework that guides the subsequent analysis and offers actionable insights for both academia and industry.

Methodology

Research Design

This study employs a mixed-methods research design, integrating quantitative content analysis with qualitative thematic review. The quantitative component involves extracting and synthesizing numerical performance metrics (e.g., cost reductions, lead time improvements) from a broad corpus of academic studies. The qualitative component critically examines the conceptual and operational strategies of AI-driven inventory optimization as described in the literature. This design is justified by the research objectives: to quantify measurable financial and operational benefits while also exploring nuanced sustainability and implementation challenges in airline logistics.

Sampling Technique and Participants

A purposive sampling strategy was adopted to select studies directly addressing AI-driven predictive analytics in airline inventory management. The initial dataset was obtained via a comprehensive search across the Semantic Scholar corpus. Studies were included if they met specific criteria related to industry focus, quantifiable outcomes (e.g., inventory cost reductions, operational efficiency gains), study design (empirical or systematic review/meta-analysis), practical implementation of AI techniques, and a focused examination of inventory optimization components. Although no human participants were directly involved, the selected studies represent the "participants" of the analysis comprising a mix of research from commercial and military aviation contexts, including contributions from experts in digital transformation and airline management.

Data Collection Methods

Data were collected through a systematic literature search and extraction process. The search query derived from the research questions targeted studies addressing "AI-Powered Inventory Optimization in Airline Logistics" and related themes such as sustainability, operational efficiency, and economic benefits. From the initial pool, 499 papers were screened based on predetermined inclusion criteria. Data extraction was performed using a structured approach facilitated by an AI-driven language model. Specific data columns such as research methodology, AI techniques used, performance metrics, and contextual details were extracted to ensure both quantitative and qualitative dimensions of the studies were captured. Secondary sources included academic journals, conference proceedings, and industry reports.

Data Analysis Procedures

The analytical procedures incorporated both quantitative and qualitative techniques:

- *Quantitative Analysis:* Descriptive statistics were used to aggregate key performance metrics such as percentage reductions in inventory costs, lead time improvements, and other operational indicators. This statistical analysis provided a numerical summary of the benefits associated with AI implementation.
- *Qualitative Analysis:* Thematic analysis was applied to identify and code recurring strategies, challenges, and sustainability outcomes in the literature. This involved categorizing AI implementation methods (e.g., machine learning, simulation techniques, optimization algorithms) and examining how these strategies align with industry-specific operational and financial objectives. These analytical techniques were chosen to directly address the research questions by linking empirical performance data with broader strategic themes in digital transformation and airline management.

Ethical Considerations

Ethical protocols were rigorously followed throughout the study. All data were obtained from publicly available academic sources and databases, ensuring adherence to copyright and intellectual property guidelines. Proper citations were maintained for all original works, and any potentially sensitive data were handled with strict confidentiality. No direct human subjects were involved, thus institutional review board (IRB) approval was not required; however, the study adhered to ethical standards for secondary data analysis and transparency in research.

Research Reliability and Validity

To ensure reliability, the study employed multiple independent screening criteria and cross-validated extracted data across diverse sources. Triangulation was achieved by integrating quantitative metrics with qualitative thematic insights, while pilot testing of the extraction protocol helped refine data collection methods. Validity was further enhanced through expert review of the methodology and findings, ensuring that the chosen techniques and interpretations accurately reflect the operational realities and strategic imperatives of AI-driven inventory optimization in the aviation sector.

Findings and Results

Presentation of Data

Our analysis of 40 studies on AI-driven inventory optimization in airline logistics reveals several key quantitative and qualitative performance improvements. The data extracted indicate that:

- Inventory Cost Reductions: Several studies report significant cost savings. For instance, Abdol Rahim et al. [4] observed a 26.34% reduction, while Alhafsi [5] documented reductions up to 40.17%. One case even reported savings of US$10 million per year [11].
- Inventory Level Reductions: Research findings show inventory decreases ranging between 20% and 54%. Pardede [6] reported at least a 30% reduction in inventory levels, and Rodrigues and Yoneyama [20] noted reductions in stock position by 34% to 54%.
- Operational Efficiency Improvements: Studies highlight an 11.5% reduction in lead times [12], while Costantino et al. achieved 99% spare parts availability, reinforcing the enhanced responsiveness of logistics operations.
- Maintenance and Service Metrics: Sprong [21] observed a 2.1% reduction in Mean Time Between Removals (MTBR), indicating that predictive maintenance supported by AI can streamline maintenance schedules and reduce unscheduled downtime.

Visual representations (tables and figures) consistently show that simulation techniques and machine learning models are the most frequently applied methods, with simulation techniques featuring in 9 of the 40 studies and machine learning methods in 6 studies.

Explanation of Results

These findings directly address the research objectives outlined in this study. Specifically:

1. Predictive Inventory Management: The documented cost and inventory level reductions (up to 40% in some cases) provide empirical evidence that AI-driven predictive analytics effectively optimize spare parts inventories. This confirms that these techniques can significantly mitigate both shortages and excesses, thereby reducing unnecessary holding costs and freeing up working capital.
2. Sustainability and Efficiency Enhancements: Although few studies explicitly quantify sustainability metrics, the observed reductions in inventory levels imply indirect sustainability benefits such as decreased waste and lower energy consumption in warehousing. The reduction in lead times and improvements in spare parts availability further support enhanced operational efficiency, aligning with sustainability objectives by minimizing transportation needs and reducing the overall carbon footprint.
3. Economic Benefit Assessment: The aggregated financial performance indicators such as reductions in inventory costs (ranging from 10% to over 40%), cost savings in emergency procurement, and improvements in working capital demonstrate that the implementation of AI-powered inventory optimization yields substantial financial benefits. The reported ROI within 1–2 years reinforces the economic rationale for integrating predictive analytics into airline logistics.

Linking Results to Research Objectives

Each key result contributes to resolving the core research problem:

- The significant reductions in inventory costs and levels validate the hypothesis that AI-driven predictive analytics can streamline inventory management in airline logistics.
- Improvements in operational metrics, such as lead time reduction and high spare-part availability, directly address the research question regarding operational efficiency and customer satisfaction.
- The potential sustainability benefits though indirectly quantified highlight the dual advantage of financial savings and environmental impact, which supports the broader objective of integrating digital transformation tools to achieve both economic and ecological sustainability.
- Finally, the diversity of AI implementation strategies identified (e.g., simulation techniques, machine learning models, and multi-criteria decision-making methods) offers practical insights into the contextual effectiveness of these approaches, particularly for stakeholders in the airline and tourism sectors.

Overall, the findings robustly support the assertion that AI-powered inventory optimization is not only a viable strategy for reducing costs and improving operational efficiency in airline logistics but also a critical step toward achieving sustainability and enhanced strategic decision-making in the digital era.

Discussion

Interpretation of Results

The findings indicate that AI-driven predictive analytics markedly improve inventory management in airline logistics. Quantitative results such as a 26.34% reduction in inventory costs [4] and inventory level decreases ranging from 20% to 54% demonstrate the ability of these technologies to mitigate both excess and shortage conditions. The reduction in lead times by approximately 11.5% and the achievement of near-perfect spare parts availability (99%) further corroborate the operational efficiencies gained through AI implementation. These results suggest that by leveraging machine learning algorithms (e.g., ARIMA and LSTM models) and simulation-based optimization techniques, airlines can not only streamline inventory processes but also enhance predictive maintenance, which in turn minimizes unscheduled downtime.

Comparison with Existing Literature

Our results are consistent with previous studies that emphasize the transformative potential of AI in supply chain management. For example, similar to findings by Alhafsi [5] and Alizadeh [22], our data indicate significant cost reductions through improved forecasting and inventory optimization. Moreover, the operational improvements reported herein such as reduced lead times and enhanced spare parts availability align with the conclusions drawn by Costantino et al. [23] and Sprong [21], who documented enhanced system responsiveness and reliability. However, while much of the literature has focused primarily on financial and operational metrics, our study also highlights indirect sustainability benefits. Although sustainability metrics were less frequently quantified in prior studies, our interpretation suggests that reductions in inventory levels contribute to decreased waste and lower energy consumption—a divergence that underscores the need for more comprehensive sustainability assessments in future research.

Implications for Theory and Practice

Theoretically, these findings contribute to digital transformation models in airline management by integrating advanced AI techniques with traditional supply chain optimization frameworks. Our results support the validity of frameworks such as the Digital Maturity Model and Porter's Five Forces in assessing the competitive advantages gained through AI integration. The demonstrated improvements in key performance indicators (KPIs) such as inventory carrying costs, lead time, and service level agreements (SLAs) further refine these theoretical models by providing quantifiable benchmarks for evaluating AI's impact.
Practically, the study offers actionable insights for airline executives and supply chain managers. First, the significant financial savings and operational efficiencies observed justify the incremental investment in AI-driven analytics. Integrating such systems with existing ERP/MRO platforms and establishing robust dashboards for real-time KPI monitoring can further enhance decision-making processes. Additionally, the indirect sustainability benefits such as reduced waste and lower carbon emissions align with broader corporate sustainability strategies, making a compelling case for adopting predictive analytics not only as a cost-saving measure but also as a critical component of sustainable operational practices.
In summary, our study confirms that AI-powered inventory optimization is a high-impact strategic investment for the aviation industry. It validates the premise that AI can deliver double-digit percentage reductions in key logistics costs while simultaneously enhancing operational efficiency and contributing to sustainability goals. These insights not only bridge gaps in current literature but also provide a robust framework for future research and practical implementation in the fields of airline management and digital transformation.

Conclusion

Summary of Key Findings

This study demonstrates that AI-driven predictive analytics can substantially optimize inventory management in airline logistics. Our findings reveal that implementing advanced machine learning and simulation-based techniques leads to significant inventory cost reductions (ranging from 25% to 40%), inventory level decreases between 20% and 54%, and improvements in operational efficiency such as an 11.5% reduction in lead times and 99% spare parts availability. These quantifiable outcomes not only validate the effectiveness of predictive inventory optimization in reducing financial and operational inefficiencies but also imply indirect sustainability benefits, including lower waste generation and reduced energy consumption in warehousing. Collectively, these results address the core research questions by establishing the dual impact of AI on both cost efficiency and environmental sustainability within the aviation sector.

Recommendations for Practitioners and Policymakers

Based on these findings, we recommend the following actions:

- Adopt AI-based Predictive Systems: Airlines should integrate robust AI-driven forecasting systems into their existing ERP/MRO frameworks to ensure real-time, data-driven decision-making.
- Establish KPI Dashboards: Implement continuous monitoring through dashboards that track key performance indicators (KPIs) such as inventory turnover ratios, lead time variances, and cost per Available Seat Kilometer (CASK) to refine and optimize inventory practices.
- Align with Sustainability Objectives: Develop inventory optimization initiatives that not only focus on financial performance but also align with corporate sustainability strategies, thereby reducing waste and lowering carbon emissions.
- Facilitate Stakeholder Engagement: Involve cross-functional teams (e.g., Maintenance, Procurement, and Operations) early in the AI implementation process to ensure operational buy-in and effective model validation.

Limitations of the Study

Despite the promising results, several limitations must be acknowledged:

- Data Heterogeneity: The reviewed studies vary considerably in terms of methodology, performance metrics, and contextual details, which may affect the generalizability of the findings.
- Quantification of Sustainability Impacts: A significant gap remains in the explicit quantification of sustainability outcomes, as most studies provided only indirect or qualitative evidence of environmental benefits.
- Contextual Constraints: The sample predominantly represents studies from diverse aviation contexts, and the specific regional or organizational nuances—such as those pertaining to the Iranian aviation industry—are not uniformly captured.
- Methodological Variability: Variations in research design and the absence of standardized benchmarks across studies pose challenges to drawing broad, definitive conclusions.

Directions for Future Research

Future investigations should aim to:

- Quantify Sustainability Metrics: Incorporate precise and measurable sustainability indicators (e.g., carbon emissions per spare part, energy consumption rates) to better assess the environmental benefits of AI-driven inventory optimization.
- Examine Lifecycle Impacts: Explore the full lifecycle of spare parts, including end-of-life management and recycling potential, to provide a more comprehensive evaluation of sustainability outcomes.
- Context-Specific Analysis: Conduct regionally focused studies—particularly in under-represented markets such as the Iranian aviation sector—to account for contextual differences in technology adoption and operational practices.
- Integrate Qualitative Assessments: Supplement quantitative findings with qualitative analyses of stakeholder engagement, organizational change, and the integration challenges associated with digital transformation.
- Develop Standardized Benchmarks: Establish common performance metrics and benchmarks that can be universally applied to evaluate the efficacy of AI solutions across various airline logistics operations.

In summary, the research substantiates that AI-driven predictive inventory management is a high-impact strategic investment for airlines. By delivering significant financial, operational, and potential sustainability benefits, these systems represent a transformative tool for modernizing inventory management in the aviation industry.

References

[1] Vikram, C. G. N., Arumugam, S., & Koilakuntla, M. (2024). Adoption of Artificial Intelligence Techniques for Inventory Management: A Case Study in the Aviation Sector. American Journal of Industrial and Business Management. https://doi.org/10.4236/ajibm.2024.145040
[2] Bergman, J.J. (2014). A Bayesian approach to demand forecasting. Submitted by the University of Missouri--Columbia Graduate School.
[3] Lendermann, P., Thirunavukkarasu, A., Low, M.Y., & McGinnis, L.F. (2012). Initial provisioning and spare parts inventory network optimisation in a multi maintenance base environment. Proceedings Title: Proceedings of the 2012 Winter Simulation Conference (WSC), 1-10. https://doi.org/10.1109/WSC.2012.6465103
[4] Rahim, F. H. A., Noor, N., Abdullah, H., & Annanurov, B. (2020). Cost minimization of aircraft critical components for planning and maintenance requirements. International Journal of Integrated Engineering, 12(7), 265–274. https://doi.org/10.30880/ijie.2020.12.07.005
[5] Alhafsi, R.I. (2018). ANALISIS PERSEDIAAN SUKU CADANG PADA PERAWATAN PESAWAT UDARA DI PT. PUTRA ELANG ANGKASARAYA DENGAN MODEL PERIODIC REVIEW.
[6] Pardede, E.K. (2013). Service bulletin inventory management and modeling for aerospace parts in customer service organization.
[7] Ramírez-Hernández, J.A., Oakley, S., Zhang, M., & Scalise, A. (2016). A simulation-based method for inventory ownership planning of aircraft spare engines and parts. Int. J. Simul. Process. Model., 11, 477-491.https://doi.org/10.1504/IJSPM.2016.10001551
[8] Ramírez-Hernández, J.A., Oakley, S., Zhang, M., & Scalise, A. (2014). Simulation approach for aircraft spare engines & engine parts planning.
[9] Merve, Ahin, Kizilaslan, R., & Demirel, Ö.F. (2015). Forecasting Aviation Spare Parts Demand Using Croston Based Methods and Artificial Neural Networks.
[10] Imran, S., Amir, S., J., A., Julio, C. esar M. inez E., Luis, A. D. L. opez, E., B. T., & Imran, A. (2023). Spare Parts Forecasting and Lumpiness Classification Using Neural Network Model and Its Impact on Aviation Safety. Applied Sciences. https://doi.org/10.3390/app13095475
[11] Gehret, G.H. (2015). Advancing Cost-Effective Readiness by Improving the Supply Chain Management of Sparse, Intermittently-Demanded Parts.
[12] Hong-fu, Z. (2008). Optimization model of spare parts inventory for civil aircraft based on marginal utility. Journal of Traffic and Transportation Engineering.
[13] Feng, G. (2008). Multi-Period Optimization for Repairable Spare Parts Inventory Using Genetic Algorithm.
[14] Ayu Nariswari, N. P., Bamford, D., & Dehe, B. (2019). Testing an AHP model for aircraft spare parts. Production Planning & Control, 30(4), 329–344. https://doi.org/10.1080/09537287.2018.1555341
[15] MoghadasNian, S. A., & NaziriHosseinpour, P. (2024). Airline logistics efficiency: KPI-driven strategies. The Fourth International Conference on Advanced Research in Management and Humanities, Munich, Germany.
[16] Moghadasnian, S. (2022). Flight to Excellence: A Comprehensive Guide to Key Performance Indicators in the Airline Industry: Unlocking Success Through Data-Driven Strategies and Performance Metrics. Aviation and Tourism Research and Innovation Center (ATRIC). Digital Publication. Tehran, Iran & Milan, Italy.
[17] Moghadasnian, S. (2020). Soaring Above Boundaries: A Comprehensive Guide to KPIs for the Chief Logistics Officer in the Airline Industry: Leveraging Metrics to Optimize Airline Logistics and Streamline Operations. Aviation and Tourism Research and Innovation Center (ATRIC). Digital Publication. Tehran, Iran & Milan, Italy.

[18] MoghadasNian, S. A., & MahMoudy, M. (2025). Airline logistics AI performance framework: A 360-degree, multi-layered KPI approach for safety, sustainability, efficiency, and innovation. 20th Iranian International Industrial Engineering Conference, Tehran, Iran.
[19] MoghadasNian, S. A. (2025). Digital transformation in airline logistics: A data-driven approach to enhancing cost efficiency and operational performance. In 19th International Conference on Modern Research in Management, Economics, Accounting and Banking, Tbilisi, Georgia.
[20] Rodrigues, L.R., & Yoneyama, T. (2012). Spare Parts Inventory Control for Non-Repairable Items Based on Prognostics and Health Monitoring Information.
[21] Sprong, J.P. (2019). Prognostics-driven supply chain optimization in commercial aviation.
[22] Alizadeh, K.M. (2015). Optimizing inventory planning for aircraft component maintenance.
[23] Costantino, F., Gravio, G.D., Patriarca, R., & Tronci, M. (2015). Spare parts inventory control model for the aeronautical industry.