

Strategic Scaling of Malaysia's Aerospace MRO Industry: A Conceptual Framework for Enhancing Global Competitiveness

Mohd Zamri Abu Bakar¹, Ariff Azly Muhamed², Mohadzlishah Mazli³, Mohd Fikri Ishak⁴

Faculty of Business and Management, Universiti Teknologi MARA, Selangor, Malaysia

DOI: <https://doi.org/10.47772/IJRISS.2026.1014MG0142>

Received: 29 June 2026; Accepted: 04 July 2026; Published: 15 July 2026

ABSTRACT

The global aerospace Maintenance, Repair and Overhaul (MRO) industry has become an integral part of the global aviation ecosystem driven by rising demand for advanced maintenance capabilities, digital technologies and value-added service solutions. With Malaysia's aspiration to strengthen its position as a regional aerospace hub through the Malaysia Aerospace Industry Blueprint 2030, the industry is increasingly being pressured to shift from conventional labour-intensive maintenance activities to high-value aerospace services that are driven by innovation. This conceptual paper seeks to fill this gap by providing an integrated framework that explains the strategic factors influencing the global competitiveness of Malaysia in aerospace MRO. The proposed framework is developed through a critical review and synthesis of the extant literature and is grounded in the Resource-Based View (RBV), Dynamic Capabilities Theory and the Global Value Chain (GVC) perspective. The framework recognised Digital Transformation (DT), High-Value Services (HVS), Regional Expansion (RE), Quality Management (QM) and Institutional Support (IS) as the main strategic drivers that collectively improve Malaysia's global competitiveness in aerospace MRO. This paper contributes to aerospace management literature by proposing a holistic conceptual model integrating technological, organisational and institutional dimensions into a unified strategic perspective for industry scaling. The proposed framework also provides practical guidance for policymakers, aerospace organisations and industry stakeholders to formulate long-term strategies to enhance Malaysia's competitiveness as a sustainable and globally recognised aerospace MRO hub.

Keywords: Aerospace MRO; Digital Transformation; High-Value Services; Institutional Support; Global Competitiveness

INTRODUCTION

The global aviation sector is currently undergoing a structural transformation, with Maintenance, Repair, and Overhaul (MRO) outsourcing emerging as a critical strategy for airlines aiming to optimize costs and access specialized technical capabilities (Ison, 2026). This transformation has been further accelerated by the increasing complexity of modern aircraft, rapid technological advancement, and growing demand for cost-efficient maintenance solutions, compelling airlines to rely more heavily on specialized third-party MRO providers. In this context, Malaysia has strategically positioned itself to capture a larger share of this market by leveraging its advantageous geographic location and robust government-led industrial collaboration initiatives (Bakar et al., 2025). By facilitating technology transfers and specialized skill development through the Industrial Collaboration Program (ICP), the country aims to pivot from low-margin manual tasks toward a high-income, knowledge-based aerospace ecosystem (Bakar et al., 2024). Collectively, these developments demonstrate Malaysia's strategic commitment to strengthening its aerospace MRO capabilities as a foundation for enhancing regional and global competitiveness.

Malaysia's ambition to become a leading regional aerospace MRO hub remains constrained by several structural and institutional challenges. Domestic firms must overcome systemic challenges regarding the integration of advanced research and development facilities and the need for more cohesive participation within global supply chains (Bakar et al., 2025). Such governance must effectively counter the strategic bottlenecks imposed by

Original Equipment Manufacturers (OEM), who increasingly consolidate control over co-specialized assets to limit the operational autonomy of independent service providers (Hallensleben et al., 2025). Domestic MRO providers continue to concentrate on labour-intensive maintenance activities with relatively limited involvement in high-value services such as engine overhaul, advanced avionics, predictive maintenance, digital engineering, and integrated lifecycle support. This capability gap restricts their ability to capture higher value-added segments of the global aerospace value chain and limits opportunities for technological upgrading. Addressing these structural barriers is fundamental for scaling Malaysia's aerospace MRO industry beyond conventional maintenance activities toward high-value, technology-intensive services.

Malaysia's aerospace ecosystem is characterized by a mix of mature maintenance and manufacturing facilities alongside emerging, high-value service providers, a landscape explicitly mapped by the National Aerospace Industry Blueprint (Bakar et al., 2025). This foundational policy, which has now evolved into Malaysia Aerospace Industry Blueprint 2030, establishes a clear trajectory for the nation to emerge as a premier aerospace hub by accelerating technical competencies in avionics, sophisticated aerostructure manufacturing, and integrated MRO services (Bakar et al., 2024, 2025). Despite the commendable growth of existing capabilities, particularly in component fabrication and specialized MRO, realizing these long-term aspirations demands a deliberate transition from labour-intensive operations toward an innovation-driven model supported by enhanced industrial collaboration and robust governmental oversight (Jaafar et al., 2024). The enhancement of innovation capability and the rapid development of high-value aerospace services are strategic priorities to sustain the long-term industrial competitiveness of Malaysia.

Besides technological up-gradation, regional development has also emerged as a strategic necessity for the strengthening of Malaysia's aircraft MRO industry. Regulatory and strategic hurdles necessitate a reassessment of current industrial policy to foster deeper collaboration between domestic MRO stakeholders and global technology leaders (Hisan et al., 2024). The transition toward bundling MRO services with emerging aircraft leasing models offers a viable pathway for local firms to achieve scale economies and improve profitability in a highly competitive market environment (Chen et al., 2026). Rated policy frameworks, coupled with a focus on human capital development, are therefore critical to ensuring that Malaysia's aerospace ecosystem can effectively capture a larger share of the burgeoning Asia-Pacific maintenance demand (Franciscus, 2021; Kamat et al., 2021). By systematically prioritizing research and development-led competencies and fostering deeper, more cohesive linkages between industry stakeholders, academia, and governmental support structures, domestic MRO providers can transcend the structural limitations of traditional, labour-heavy models to secure a more resilient and profitable position within the increasingly competitive global aerospace value chain.

Although prior studies have investigated aerospace industrial development, technology transfer, industrial collaboration and MRO capabilities individually, there is a scarcity of literature on the strategic integration of high-value service development and regional expansion for improving Malaysia's global aerospace competitiveness (Bakar et al., 2024; Franciscus, 2021; Kamat et al., 2021). The synergy of advanced service offerings, regional market expansion, innovation ecosystems and global value chain participation is not addressed. This presents a significant theoretical and practical gap, especially as Malaysia aims to be a leading aerospace hub under the Malaysia Aerospace Industry Blueprint 2030. The objective of this paper is to propose a strategic framework for scaling up Malaysia's aerospace MRO industry by incorporating high-value services and regional expansion strategies for improved global competitiveness. The findings are expected to contribute to the body of literature on the development of the aerospace industry and provide practical recommendations to policymakers, industry practitioners and investors to strengthen Malaysia's position in the global aerospace value chain.

LITERATURE REVIEW

Digital Transformation (DT)

The existing academic discourse underscores a persistent gap in the practical application of digital and procedural innovations within the MRO sector, where traditional labour-intensive processes often impede the adoption of

high-value, integrated service models (Ichou & Veress, 2024). This gap is of particular relevance, as the competitiveness of today's aerospace MRO is increasingly based not only on technical maintenance capability but also on the ability to provide integrated, data-driven and customer-oriented service solutions (Jaafar et al., 2024). Recent studies highlights that transitioning toward "total care" service paradigms necessitates a shift from fragmented repairs to integrated, value-added lifecycle management, which remains critical for responding to the evolving demands of global airline operations (Bakar et al., 2024 ; Hutabarat et al., 2023). Integrating advanced digital technologies into MRO workflows provides the operational flexibility required to maintain a competitive edge, while sustainability-oriented practices are increasingly vital for meeting stringent environmental regulatory pressures (Mızrak, 2025). Thus, digital and procedural innovation has become a central enabler for transforming MRO firms from conventional repair providers into strategic lifecycle service partners.

High-Value Services (HVS)

High-value MRO services are complex maintenance activities that deliver increased technical, commercial and strategic value versus routine, labour-intensive repairs (Hisan et al., 2024). These include predictive maintenance, engine and component overhaul, avionics support, digital diagnostics, integrated fleet support, lifecycle management and sustainability-oriented maintenance solutions. Integrated management systems, and predictive maintenance in particular, are a strategic imperative for moving from reactive workflows to optimized asset performance (Kabashkin & Susanin, 2024; Weiß et al., 2025). This paradigm shift allows MRO providers to provide "total care" solutions, shifting from disjointed, transactional repairs to comprehensive, value-added lifecycle management (Hutabarat et al., 2023). Predicting component failures before they occur, based on real-time diagnostic data, rather than after the fact, can help firms to improve aircraft availability and operational predictability, which are critical to remaining competitive in the global aviation value chain (Kabashkin & Susanin, 2024; Tan, 2026). Consequently, high-value service development is an important avenue for MRO providers looking to enhance profitability, customer retention and global market positioning.

Regional Expansion (RE)

Regional expansion has become an increasingly important dimension of MRO competitiveness, particularly within Southeast Asia's growing aviation market (Tan, 2026). Regional synergy through shared service frameworks can further enhance performance by streamlining spare part procurement and optimizing fleet availability across Southeast Asian maintenance hubs (Tran & Hoàng, 2025). Regional expansion offers opportunities to serve neighbouring airline markets, strengthen cross-border maintenance networks, and position local firms as integrated service providers within the Asia-Pacific aerospace value chain. Effective implementation of these integrated frameworks requires a multi-dimensional approach that aligns organisational strategy with workforce skill development and robust cross-industry collaboration (Agrawal, 2025). However, regional expansion also requires Malaysian MRO firms to meet international standards of reliability, turnaround time, certification, digital traceability, and service integration. Therefore, the ability to combine high-value service capability with regional market access is essential for strengthening Malaysia's long-term aerospace competitiveness.

Quality Management (QM)

The implementation of standardized quality management systems consistent with international regulatory agencies remains a prerequisite for Malaysian companies to obtain the certifications of reliability and safety needed to win high-margin global contracts (Nor & Nasir, 2023; Siriwoharn et al., 2023). Quality certification is not only a compliance requirement, but also a strategic market-entry condition for companies that want to join global maintenance networks in the aerospace MRO industry (Ziakkas et al., 2026). Quality management has evolved from a compliance function to a strategic capability that provides competitive differentiation in the complex aerospace MRO industry (Gajdušková et al., 2025). Effective quality management must be closely integrated with supply chain coordination to achieve consistency in maintenance operations, component traceability, information sharing and service reliability (Ibrahim et al., 2025). Such integration is important for Malaysian small and medium-sized MRO enterprises (SMEs) that are limited by digital infrastructure, technical

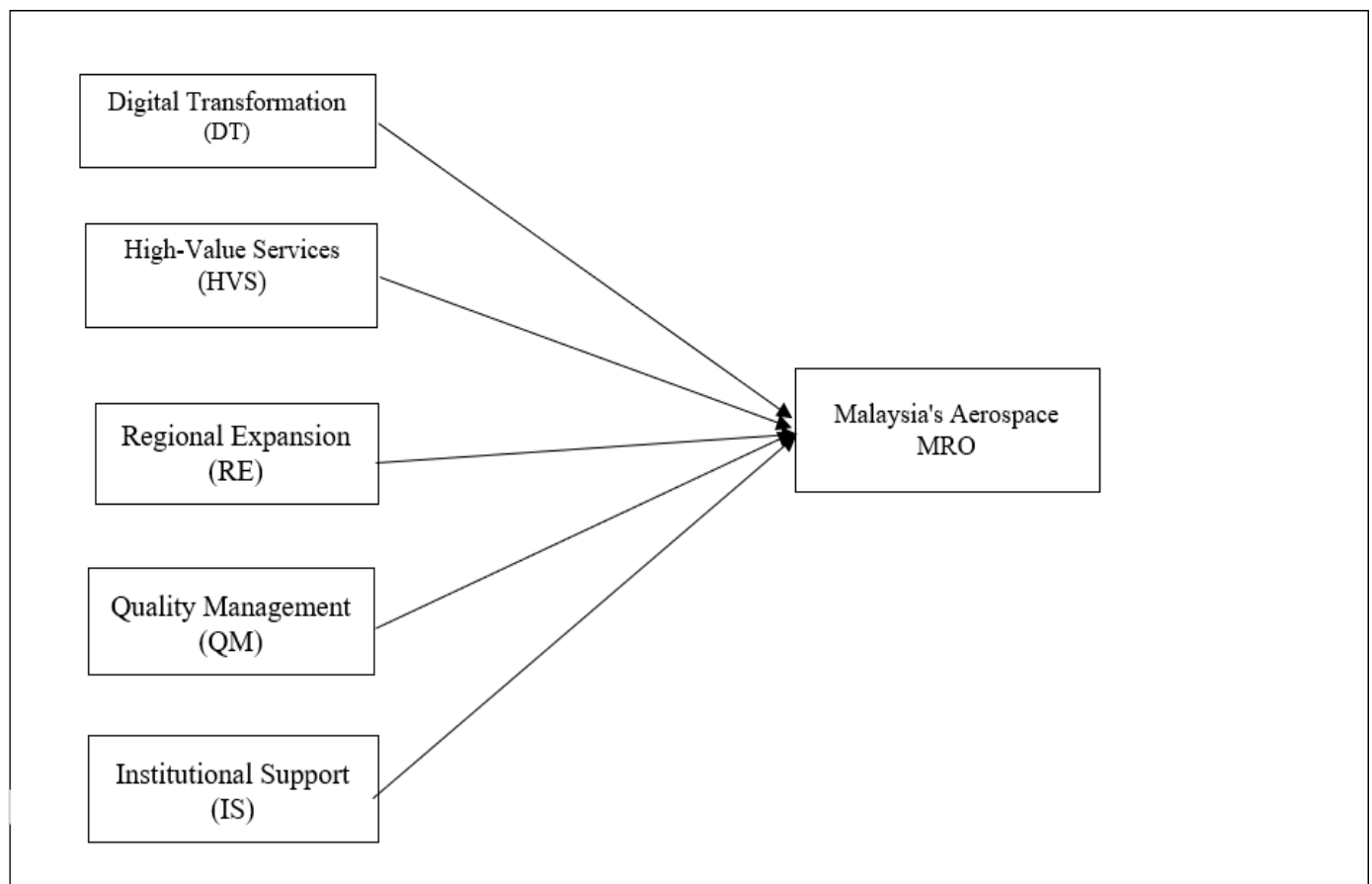
certification, access to knowledge controlled by Original Equipment Manufacturers (OEMs) and global procurement systems. These limitations hinder their ability to meet international quality standards and to engage effectively in higher value-added aerospace activities

Institutional Support (IS)

Policy interventions are needed to overcome structural inequities that limit the strategic scaling of Malaysia's aerospace MRO industry by aligning institutional support with the technology needs of a developing aviation landscape (Ichou & Veress, 2024; Kartika et al., 2026). Strategic policy frameworks should therefore integrate organisational governance with technological deployment to support indigenous MRO providers in transitioning towards high-value, resilient, and innovation-driven business models (Xing et al., 2022). Integrated policy approaches need to promote stronger collaboration among industry, government, and academia to accelerate the adoption of Industry 4.0 technologies. These collaborative ecosystems are vital for bridging existing gaps in research and development (R&D) infrastructure that continue to limit Malaysia's ability to attract high-value and technology-intensive aerospace investments (Hanafi et al., 2023; Leang & Rasiah, 2023). By integrating national aerospace policies, digital transformation initiatives, human capital development, research capability, and industrial collaboration, Malaysia can strengthen its capacity to develop high-value MRO services, expand regional market participation, and enhance its long-term global competitiveness.

Grounded in the existing literature, the proposed conceptual framework is developed to illustrate the key constructs and their interrelationships

Figure 1 illustrates the proposed framework for a Malaysia's aerospace MRO Global Competitiveness



CONCLUSION

The paper develops a strategic framework for exploring how Malaysia's aerospace Maintenance, Repair and Overhaul (MRO) industry could improve its global competitiveness through the synergistic integration of high-value service development and regional expansion. The study, based on a systematic literature synthesis, demonstrates that strategic scaling involves not only increasing maintenance capacity but also continuous capability upgrading, technological transformation, quality management, institutional collaboration, and stronger participation in regional and global aerospace value chains.

Findings indicate that the development of digital technology, high-value services, including predictive maintenance, integrated lifecycle management, advanced component repair and 'total care' service models, is a key way for Malaysian MRO providers to move beyond traditional, labour-intensive maintenance activities. At the same time, regional expansion through strategic alliances, cross-border collaboration and engagement in Asia-Pacific aerospace networks presents opportunities for market diversification, economies of scale and deeper integration into international aerospace ecosystems.

The study further emphasizes that the achievement of these strategic pillars depends on an array of enabling capabilities including digital transformation, quality management, supply chain integration, institutional support, organisational governance, human capital development and research and development collaboration. These factors do not operate in isolation, but mutually reinforce each other to improve innovation capability, operational resilience and long-term industrial competitiveness. This finding supports the suggested conceptual framework that considers organisational capabilities as the basis for sustainable scaling of the aerospace industry.

The study contributes theoretically to the literature on aerospace management by integrating the Resource-Based View (RBV), Dynamic Capabilities Theory, and the Global Value Chain (GVC) perspective into a unified strategic framework for aerospace MRO development. This integration adds to the extant knowledge by showing how internal capabilities, institutional support and regional market expansion interlace to facilitate industrial upgrading within an emerging aerospace economy.

From an industry standpoint, this research provides strategic guidance to industry stakeholders, aerospace companies, and policymakers. Government agencies should continue to enhance policies to encourage technology transfer, Industrial Collaboration Programme (ICP) initiatives, research and development partnerships, capability development of the workforce and international certification. In the meantime, MRO organisations should focus their investments in digital technologies, predictive maintenance, quality management systems and collaborative innovation to improve their participation in higher value-added segments of the global aerospace market.

Although there are these contributions, this study is conceptual and is based on a systematic synthesis of extant literature. As a result, the proposed framework has not been empirically tested. Future research should examine the proposed relationships using quantitative techniques such as Structural Equation Modelling (SEM), longitudinal case studies, or mixed-method research with aerospace industry practitioners. Future research could also investigate the role of emerging technologies such as AI, digital twins, blockchain, and Maintenance 5.0 in enhancing the delivery of high-value services and regional competitiveness in Malaysia's aerospace MRO industry.

The strategic scaling of the aerospace MRO industry in Malaysia requires a holistic approach to focus on digital transformation, high-value services, regional expansion, quality management, and institutional support simultaneously. This integrated strategy will help Malaysia to further enhance its global aerospace competitiveness, engage in more high value-added segments of the global aerospace value chain and realise its long term aspiration to be a leading aerospace hub in the Asia Pacific region.

REFERENCES

1. Agrawal, Y. (2025). Asia Pacific Perspectives on Digital Innovation and Integrated Frameworks in Aerospace Manufacturing (pp. 119–140). <https://doi.org/10.4018/979-8-3373-1082-4.ch006>
2. Bakar, M. Z. A., Jaafar, J., Muhamed, A. A., Rahman, A. A. M. M. A., & Rasedee, A. F. N. (2024). Leveraging the Industrial Collaboration Program for Malaysia's Aerospace Industry. *Advances in Social Sciences Research Journal*, 11(1), 199–207. <https://doi.org/10.14738/assrj.111.16271>
3. Bakar, M. Z. A., Muhamed, A. A., Mazli, M., Ishak, M. F., & Samat, M. F. (2025). Ascending the Value Chain: Strategic Growth in Malaysia's Aerospace Sector. *International Journal of Research and Innovation in Social Science*, 1420–1427. <https://doi.org/10.47772/ijriss.2025.907000118>
4. Chen, J., Lim, C. P., Tan, K. H., Govindan, K., & Kumar, A. (2021). Artificial intelligence-based human-centric decision support framework: an application to predictive maintenance in asset management under pandemic environments. *Annals of Operations Research*, 350(2), 493–516. <https://doi.org/10.1007/s10479-021-04373-w>
5. Chen, R., Jiang, C., & Yang, H. (2026). Aircraft export modes with MRO integration: leasing vs. direct sales. *Transportation Research Part A Policy and Practice*, 205, 104849–104849. <https://doi.org/10.1016/j.tra.2025.104849>
6. Chien, C.-W., Liou, J. J. H., & Huang, S.-W. (2025). Identifying and Mapping Challenges of Industrial-to-Aviation Transformation Through Aczel–Alsina and Grey DEMATEL-ISM Analysis. *Applied Sciences*, 15(11), 6242–6242. <https://doi.org/10.3390/app15116242>
7. Dahlan, J. M., Samat, O., & Othman, A. A. (2015). Upgrading in Global Value Chain of Malaysian Aviation Industry. *Procedia Economics and Finance*, 31, 839–845. [https://doi.org/10.1016/s2212-5671\(15\)01176-4](https://doi.org/10.1016/s2212-5671(15)01176-4)
8. Fauziana, D. R., & Adwiyah, R. (2023). Value Analysis in Airframe Manufacturing Industry: A Value Network Approach. *Jurnal Nusantara Aplikasi Manajemen Bisnis*, 8(2), 237–250. <https://doi.org/10.29407/nusamba.v8i2.20028>
9. Franciscus, F. (2021). Development of Roadmap for the Aircraft Maintenance Industry, Maintenance Repair & Overhaul/MRO, in Indonesia. *Journal of Innovation and Technology*, 2(2), 54–59. <https://doi.org/10.31629/jit.v2i2.4277>
10. G., M. T. Z. (2025). Developing Effective Marketing Strategies for A New Mro Company: A Case Study of Akasa Teknologi Nusantara At Soekarno-Hatta International Airport. *Eduvest - Journal Of Universal Studies*, 5(8), 10691–10708. <https://doi.org/10.59188/eduvest.v5i8.50910>
11. Gajdušková, T., Jenčová, E., Turac, A., Majorska, D., Hreskova, K., & Galgóci, G. (2025). Regulatory Framework of EASA, European Strategies, and Practical Applications of Artificial Intelligence in Aviation. 78–83. <https://doi.org/10.1109/ntad67887.2025.11302664>
12. Gumariato, M. R. (2025). Developing Effective Marketing Strategies for A New MRO Company: A Case Study of Akasa Teknologi Nusantara at Soekarno-Hatta International Airport. *Return Study of Management Economic and Bussines*, 4(3), 227–247. <https://doi.org/10.57096/return.v4i3.347>
13. Hallensleben, C., Albers, S., & Dewulf, W. (2025). Strategic bottlenecks in commercial aviation MRO: OEM influence and the response of traditional maintenance providers. *Journal of the Air Transport Research Society*, 5, 100084–100084. <https://doi.org/10.1016/j.jatrs.2025.100084>
14. Hanafi, A. G., Ahmad, H. H., Mansor, M. F., & Mustafa, W. A. (2023). An Integrated Approach in Empowering Technical and Vocational Education and Training (TVET) for Malaysian Asnaf in the IR4.0 Era. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, 30(2), 255–271. <https://doi.org/10.37934/araset.30.2.255271>
15. Hisan, H., Badruddin, N. A., & Yusof, K. H. (2024). A Review of Malaysia's Aerospace Manufacturing Post-COVID19 Pandemic Using Michael Porter's Five Competitive Forces Model. *E3S Web of Conferences*, 477, 48–48. <https://doi.org/10.1051/e3sconf/202447700048>
16. Holzinger, A., Schweier, J., Gollob, C., Nothdurft, A., Hasenauer, H., Kirisits, T., Häggström, C., Visser, R., Cavalli, R., Spinelli, R., & Stampfer, K. (2024). From Industry 5.0 to Forestry 5.0: Bridging the gap with Human-Centered Artificial Intelligence. *PubMed Central*, 10(6), 442–455. <https://doi.org/10.1007/s40725-024-00231-7>

17. Hutabarat, J., Nugroho, B. Y., & Huseini, M. (2023). Productization of Services as a Growth Strategy for Aircraft MRO Company. In *Advances in economics, business and management research/Advances in Economics, Business and Management Research* (pp. 1735–1740). Atlantis Press. https://doi.org/10.2991/978-94-6463-234-7_182
18. Ibrahim, Q. M. A., Ahmed, M. D., & Mustapen, R. B. N. (2025). Conceptual Framework for Supply Chain Management Strategies and Aviation Ground Maintenance Operations Sustainability: Mediation Role of Supply Chain Management Capabilities. *Advanced and Sustainable Technologies (ASET)*, 4(1), 262–272. <https://doi.org/10.58915/aset.v4i1.2180>
19. Ichou, S., & Veress, Á. (2024a). Hierarchy of Roadmap Items: Prioritization Strategy Development in Aircraft MRO Industry to Enhance Profit and Sustainability. *Acta Polytechnica Hungarica*, 21(6), 187–201. <https://doi.org/10.12700/aph.21.6.2024.6.10>
20. Ichou, S., & Veress, Á. (2024b). Satisfying the needs for highly qualified engineering staff in a disruptively changing aircraft industry with special care for MRO sector. *Aircraft Engineering and Aerospace Technology*, 96(7), 900–911. <https://doi.org/10.1108/aeat-12-2023-0347>
21. Ison, D. C. (2026). The Evolution of MRO Outsourcing: Global Trends, Regulatory Challenges, and Strategic Considerations in Aviation Maintenance. *Journal of Aviation Technology and Engineering*, 15(1). <https://doi.org/10.7771/2159-6670.1355>
22. Jaafar, J., Bakar, M. Z. A., & Muhamed, A. A. (2024). Malaysia's Industrial Competitiveness: Overview of Malaysia's Industrial Collaboration Programme. *Advances in Social Sciences Research Journal*, 11(10), 50–57. <https://doi.org/10.14738/assrj.1110.17652>
23. Kabashkin, I., & Susanin, V. (2024). Unified Ecosystem for Data Sharing and AI-Driven Predictive Maintenance in Aviation. *Computers*, 13(12), 318–318. <https://doi.org/10.3390/computers13120318>
24. Kamat, S. R., Hassan, F. M., Mahmood, W. H. W., Ani, M. F., & Suliswiyadi. (2021). Critical Factors Influencing Project on Effective Maintenance, Repair and Overhaul (MRO) in Aircraft Aviation Industry. *Malaysian Journal on Composites Science and Manufacturing*, 4(1), 1–10. <https://doi.org/10.37934/mjcs.4.1.110>
25. Kartika, N., Siswanto, N., Vanany, I., & Shalahuddin, L. (2026). DEMATEL-based analysis of critical success factors for the development of Indonesia's aircraft component supporting industry. *Decision Science Letters*, 15(2), 395–406. <https://doi.org/10.5267/j.dsl.2026.2.001>
26. Latif, A., & Saari, S. (2023). Government Initiatives to Promote Adoption of IR4.0 Technologies in Manufacturing (pp. 228–242). <https://doi.org/10.4324/9781003367093-13>
27. Leang, Y. K., & Rasiah, R. (2023). Diffusion of IR4.0 Technologies in Electronics Manufacturing (pp. 49–67). <https://doi.org/10.4324/9781003367093-4>
28. Liangrokapt, J., & Sittiwatethanasiri, T. (2022). Strategic direction for aviation maintenance, repair, and overhaul hub after crisis recovery. *Asia Pacific Management Review*, 28(2), 81–89. <https://doi.org/10.1016/j.apmr.2022.03.003>
29. Linn, G., M.H., W., Mary, & Eva, M. (2025). A Maintenance Repair and Overhaul Model for Operational Sustainability; Incorporating processes and risks. *Scholarly Commons (Embry–Riddle Aeronautical University)*. <https://commons.erau.edu/publication/2439>
30. Madzik, P., & Suwannasap, N. (2023). Supplier relationship management and its impacts on purchasing performance in aircraft maintenance, repair, and overhaul in Thailand. *Acta Logistica*, 10(4), 577–587. <https://doi.org/10.22306/al.v10i4.436>
32. Mızrak, K. C. (2025). Prioritizing Growth Strategies in Aviation Sector: a Fuzzy DEMATEL Approach. *Politik Ekonomik Kuram*, 9(3), 921–939. <https://doi.org/10.30586/pek.1608924>
33. Mohamed, A. (2025a). The role of Predictive Maintenance Management in Enhancing Operational Efficiency. In *American University of Bahrain*. <https://doi.org/10.58014/aubh.30609833>
34. Mohamed, A. (2025b). The role of Predictive Maintenance Management in Enhancing Operational Efficiency [Figshare (United Kingdom)]. In Figshare. <https://doi.org/10.58014/aubh.30609833.v1>
35. Nor, N. M., & Nasir, N. M. (2023). The Role of STRAND in Malaysia's Industrial Transformation (pp. 207–227). <https://doi.org/10.4324/9781003367093-12>

36. Rahman, H. M. M., Malarvizhi, C. A. N., Khan, N., Adamu, A. A., & Khan, S. (2026). Building a Sustainable and Human-Centered Future: Industry 5.0 in Malaysia. *Advanced Industrial and Business Management*, 1(1). <https://doi.org/10.53623/aibm.v1i1.913>
37. Siriwoharn, T., Thianthong, T., & Lakkhongkha, K. (2023). Managing Aircraft Maintenance In Thailand For The Next Normal. *International Journal of Professional Business Review*, 8(5). <https://doi.org/10.26668/businessreview/2023.v8i5.2217>
38. Sutrisno, D. H., Wibowo, W., & Ardi, T. Y. (2025). Readiness of F-16 Aircraft of the Indonesian Air Force in The Face of Regional Geopolitical Dynamics A Case Study of The Maintenance Depot 80. *Journal Of Social Research*, 4(7), 1889–1897. <https://doi.org/10.55324/josr.v4i7.2692>
39. Tan, J. C. H. (2026a). Leveraging Aviation Technology for Sustainable Resilience in Asia Pacific. In Singapore Institute of Technology. <https://doi.org/10.25447/sit.31429169.v1>
40. Tan, J. C. H. (2026b). Leveraging Aviation Technology for Sustainable Resilience in Asia Pacific. In Singapore Institute of Technology. <https://doi.org/10.25447/sit.31429169>
41. Tran, T. T. T., & Hoàng, N. T. (2025). The Development of MRO Shared Services in Vietnam: A Comparative Analysis with Southeast Asian Countries. *International Journal of Aviation Science and Technology*, 79–90. <https://doi.org/10.23890/ijast.vm06is02.0202>
42. Weiß, M., Kamtsiuris, A., Raddatz, F., & Wende, G. (2025). Advanced MRO Processes in Industry 4.0 with Proactive Asset Administration Shell and Digital Product Passport. *International Journal of Prognostics and Health Management*, 16(2). <https://doi.org/10.36001/ijphm.2025.v16i2.4508>
43. Xing, Y., Liu, Y., & Davies, P. (2022). Servitization innovation: A systematic review, integrative framework, and future research directions. *Technovation*, 122, 102641–102641. <https://doi.org/10.1016/j.technovation.2022.102641>
44. Ziakkas, D., Henneberry, D., & Plioutsias, A. (2026). Regulatory Pathways for Inclusive Human Systems in Aviation: Embedding Ethics and Emerging Technologies into Global Oversight. *AHFE International*, 200. <https://doi.org/10.54941/ahfe1007104>