L&T Technology Services

Accelerating Aerospace Intelligence

AI-Driven Insights Digital-First Operations

Purposeful. Agile. Innovation.

STATE OF THE MARKET

Global aerospace OEMs and operators are under growing pressure to ensure higher asset availability, faster decision-making, and more sustainable operations. With increasing aircraft data volume and complexity, the industry is rapidly shifting toward leveraging digital twin ecosystems, predictive maintenance, and AI-enabled MRO optimization.

The major digital trends driving the emerging ecosystem include:

AI/ML-led condition-based maintenance to reduce unplanned downtime

Real-time fleet performance analytics and operational forecasting

Data engineering for connected aircraft platforms and maintenance diagnostics

Immersive solutions (AR/VR) for pilot training and maintenance task simulation

SERVICE OVERVIEW

L&T Technology Services (LTTS) delivers a robust portfolio of AI-powered and digital solutions across the aerospace lifecycle, spanning engineering, operations, and sustenance. This includes:

Predictive Analytics and Aircraft Health Monitoring

Smart analytics for flight phase monitoring, LRU failure prediction, MRO spares tracking, weight computation, and anomaly detection to preempt issues and reduce AOG events.

Business and Operations Analytics

AI/ML algorithms for fuel efficiency optimization, reliability analysis, wheel replacement prediction, and aircraft health dashboards. This also covers supply chain and shop floor performance insights for aerospace factories.

Flight Operations and Planning Solutions

Pilot performance analytics, load balancing, turnaround time optimization, and dynamic route-based planning using telemetry-based intelligence.

AI-Enabled Digital Engineering

Digital twin-based asset modeling, hardware virtualization, and synthetic simulation environments. Smart mockup creation from legacy engineering data, enriched with AI-based classification and digital annotations.

Visual and Voice AI

Document mining, text classification, sentiment analysis, image recognition, and AR/VR-powered product visualization for design validation and virtual prototyping.

Aero Application Platforms

Leveraging Edge AI (AiKno®) framework, AiTest validation engine, EDGYneer for device management, and SafeX for secure CI/CD implementation — tailored for aerospace-grade digital systems.

KEY DIFFERENTIATORS

LTTS' differentiators in the domain include:

Aerospace-specific AI Expertise
Domain-trained models and ML pipelines for predictive maintenance, aircraft health, wheel analytics, and flight-stage diagnostics – proven across commercial aviation fleets.

Digital Twin and Hardware Virtualization Frameworks
Creation of high-fidelity virtual aircraft environments for simulation, prototyping, and predictive diagnostics. Integrates legacy BOM/data sources into dynamic models.

Edge AI at Scale
AiKno® platform with 70+ patents delivers AI at the edge for aircraft systems, MRO devices, and fleet monitoring applications, improving responsiveness and security.

Immersive and Intelligent Interfaces
AR/VR-based training and maintenance tools for crew and field engineers, for enhanced safety, reduced training costs, and improved right-first-time execution.

Full-Stack Digital Engineering
Services spanning data engineering, AI/ML, DevOps, secure IoT integration, application development, and cybersecurity for enabling seamless digital transformation across the aircraft ecosystem.

BENEFITS

We ensure:

- **Up to 40% Reduction in Unscheduled Downtime**
  Predictive insights and early warning systems detect component failures before they occur, enhancing aircraft availability.
- **20–25% Efficiency Gains in Operations**
  Data-driven decision tools reduce fuel burn, optimize load distribution, and improve MRO planning accuracy.
- **Accelerated Design and Simulation Cycles**
  Digital twin and virtual product modeling enable faster prototyping and testing, reducing development cost and timelines.
- **Enhanced Safety and Compliance**
  Automated data mining, real-time analytics, and immersive training ensure higher compliance with aerospace safety standards.
- **Smarter, Connected Workflows**
  Edge AI frameworks, CI/CD platforms, and mobile analytics tools ensure rapid deployment, minimal lag, and real-time decision support at the point of use.

BUSINESS CASES

Fleet Fuel Performance Dashboard

- Developed AI engine for tracking consumption and efficiency across multiple aircraft fleets.
- Enabled 15% fuel optimization and improved route planning based on dynamic conditions.

Predictive Wheel Replacement Analytics

- Built a deep learning model to analyze wheel stress and failure risk using telemetry and runway data.
- Helped airlines wheel failures, reducing maintenance time and improving flight safety.

AI-Based Aircraft Data Migration Creation

- Automated extraction of engineering records for digital generation using classification and visual tagging tools.
- Reduced engineering cycle time by 30% and improved accuracy of design reuse.

Flight Stage Analytics Health Monitoring

- Implemented analytics suite to track LRU performance across flight phases with heatmap visualization.
- Improved fault isolation speed and reduced repeat service occurrences by over 20%.

AR/VR-Based Pilot and Maintenance Training

- Delivered virtual training modules VR simulators with sync for immersive learning.
- Reduced training costs and increased knowledge retention for maintenance staff and crew.

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ENGINEERING THE CHANGE