The next competitive edge in aerospace and defense: AI-powered sustainment

Aerospace and defense leaders responsible for program performance, operations and sustainment face compounding structural challenges: cost overruns, decade-long delivery timelines and sustainment costs that dominate life-cycle spend.

A truly human-centered approach to AI innovation can equip teams with predictive capabilities to forecast cost-to-complete trajectories, model schedule risks and dynamically quantify financial exposure. When AI tools are fully integrated with enterprise resource planning (ERP) and asset management systems, organizations can hardwire performance and sustainment to drive profitable growth.

11 Years

Average time recently required for major defense acquisition programs to deliver operational capability.

~70%

of naval life-cycle costs occur after delivery.

$11B+

estimated 2025 airline impact from supply chain-related disruptions, including maintenance inefficiencies.

From program execution to life-cycle accountability

Too often, isolated programmatic failures are blamed for systemic problems. But the real challenges lie in gaps in program governance, data integration and execution discipline. Predictive analytics applied early in the life cycle can materially reduce financial risk exposure by identifying supply-chain disruptions, engineering-rework risks and production inefficiencies before they escalate.

The shift toward life-cycle accountability is also transforming pricing strategies across commercial and defense aviation. AI-driven modeling allows organizations to simulate maintenance demand, forecast failure rates and estimate long-term sustainment costs with much greater precision.

On a $10 billion program, even a 2% cost variance can mean $200 million in margin impact.

Turn sustainment economics into life-cycle advantage

Most life-cycle cost in A&D is incurred during sustainment. Across commercial aviation, connected assets, digital twins and integrated data ecosystems can help companies anticipate maintenance demand, improve asset availability and enhance life-cycle costs. The same principles can help defense organizations secure margins on long-term performance-based contracts while improving readiness.

01 **Predict rather than react**

By integrating sensor data, maintenance records and operational usage profiles, AI models can estimate failure probabilities and enhance maintenance timing–helping reduce aircraft-on-ground events, unscheduled maintenance and lost availability.

02 **Connect the enterprise**

ERP systems provide the deterministic control layer for data integrity, governance and auditability. EAM provides life-cycle visibility across assets, while AI delivers predictive insights and optimization capabilities

03 **Create a learning system**

Embedding AI as a learning layer allows it to continuously learn from human specialists. When ERP and EAM are integrated and AI-enabled, the ERP improves the AI–and the AI improves the ERP

The evolution ai brings is here

AI has the potential to change the calculus. It can make visible what was unknowable: cost-to-complete trajectories, predictive maintenance demand curves and combat power availability weeks or months out. When intelligence is hardwired into enterprise systems, pricing sharpens and sustainment stops being a cost center and starts being a source of competitive advantage, margin protection and, in defense, mission accomplishment.

Organizations that get this now can price contracts with better confidence, secure program profitability over decades-long life cycles and deliver the operational availability their customers, commanders and taxpayers demand.

Read the full PwC white paper

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