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Mission Ready Trace: Why ALM Modernization Matters Now in Aerospace and Defense

Executive Summary: Closing the Gap Between Innovation and Readiness

Aerospace and defense organizations are innovating rapidly. Systems are becoming more advanced, more connected, and increasingly software defined.

But innovation alone is no longer enough.

The ability to design advanced systems is beginning to outpace the ability to validate, certify, produce, and deploy them with confidence. This creates a widening gap between innovation and readiness.

In aerospace and defense, the decisive question is not only what can be engineered. It is what can be verified, certified, scaled, and delivered reliably.

Application Lifecycle Management (ALM) sits at the center of this challenge. It is becoming a strategic control point for managing requirements, verification, compliance, risk, and change across complex, regulated environments. Modernizing ALM is therefore no longer only a tool decision. It is becoming essential to achieving execution certainty at program and enterprise scale.

A&D Is Entering an Era of Relentless Execution Pressure

The aerospace and defense market is under sustained pressure on multiple fronts. Organizations must respond simultaneously to rising global demand, increasing product complexity, persistent supply chain constraints, and heightened regulatory expectations. At the same time, they are being asked to reduce timelines and improve performance across the lifecycle.

Leaders are expected to:

- Accelerate development timelines
- Increase production throughput
- Deliver reliable, compliant systems from day one

The challenge is not simply innovation. It is executing at scale under constraint.

The defining advantage in aerospace and defense is no longer how fast you innovate. It is how reliably you execute.

Software-Defined Complexity Is Breaking Legacy ALM Models

Modern aerospace and defense systems are fundamentally different from those of the past. They combine software, hardware, electronics, and systems engineering in highly interconnected architectures. They operate across distributed teams, suppliers, and geographies. **They must meet strict regulatory standards and maintain full traceability across the lifecycle.**

Programs now involve:

- Large scale requirements across multiple systems
- Continuous updates and change cycles
- Strict compliance frameworks
- Cross organizational collaboration

Traditional ALM approaches were not designed for this level of complexity. **You cannot manage software-defined complexity with processes built for a different era.**

Fragmentation Is the Real Constraint on Performance

The most significant barrier to performance is not capability.

It is fragmentation. Across many organizations:

- Requirements are disconnected from validation
- Validation is disconnected from compliance
- Engineering is disconnected from downstream execution

This fragmentation creates inefficiencies throughout the lifecycle. PTC highlights disconnected systems and fragmented workflows as key drivers of delay, rework, and compliance risk across aerospace and defense programs.

The impact is systemic:

- Increased rework and late-stage issues
- Slower certification and audit readiness
- Disruption during production ramp up
- Reduced confidence in final system performance

Fragmentation is the hidden cost behind every delay, every rework cycle, and every missed commitment.

ALM Modernization Has Become a Strategic Business Lever

ALM is no longer a purely technical function. It has become a business-critical capability for controlling lifecycle execution across complex aerospace and defense programs. In this context, Capgemini contributes to strengthening digital continuity across engineering, manufacturing, validation, and operations, helping organizations manage requirements, verification, compliance, and change with greater consistency. This supports faster decision making, improved readiness for certification and production ramp-up, and stronger confidence in delivery outcomes.

PTC reinforces this view through its focus on connecting requirements, engineering, manufacturing, and service into a unified lifecycle foundation that improves execution speed and control.

Modern ALM directly impacts:

- Speed of innovation
- Production scalability
- Compliance confidence
- Operational readiness

The organizations that control lifecycle execution will control their ability to scale, compete, and deliver.

What Modern ALM Must Deliver

Modernizing ALM requires more than replacing legacy tools. It requires a new model for lifecycle execution. A modern ALM approach must provide:

A unified lifecycle backbone

A single, trusted system connecting requirements, validation, risk, and change across the enterprise

End to end traceability

Full visibility and auditability across the lifecycle, embedded into daily execution

Digital continuity across functions

Integration across engineering, manufacturing, and operations to enable coordinated decision making

Enterprise scale and governance

Support for large, distributed programs with strict regulatory requirements

Transformation, not deployment

Operating model change, adoption, and continuous improvement

The goal of modern ALM is not visibility. It is control with velocity.

Mission Ready Trace: A Transformation Approach to ALM Modernization

Mission Ready Trace is designed to address this new reality. It combines **PTC's Codebeamer platform** with **Capgemini's transformation capabilities** to modernize how aerospace and defense organizations manage requirements, verification, and compliance.

Codebeamer provides the backbone

PTC Codebeamer delivers:

- Requirements, test, and risk management in a single platform
- End to end traceability across the lifecycle
- Structured workflows aligned to regulated environments
- Scalability for large, complex programs

PTC positions Codebeamer as purpose built for aerospace and defense requirements management, supporting compliance standards, distributed collaboration, and high scale requirements environments.

Capgemini delivers the transformation

Capgemini focuses on ensuring that platform capabilities translate into consistent execution across the enterprise:

- Defining a target operating model aligned with program realities
- Establishing governance and compliance across the lifecycle
- Transitioning from fragmented legacy environments to a unified setup
- Integrating ALM into active programs in a controlled, scalable manner
- Ensuring adoption through aligned processes and ways of working
- Tracking outcomes across requirements, verification, and change

Capgemini as an end-to-end transformation partner, enables a lifecycle model that supports coordinated, traceable execution across engineering, validation, and delivery.

And ALM modernization only succeeds when technology *and* operating model evolve together.

Why the Partnership Matters

This is where most transformation efforts fall short. Organizations often invest in platforms without addressing operating model change, governance, or adoption. As a result, expected value is never fully realized.

Mission Ready Trace addresses this gap directly, with the partnership's promise of adoption, scale, and performance.

You do not transform engineering by deploying software. You transform it by changing how decisions are made and executed.

The Cost of Inaction Is Rising

Delaying ALM modernization carries increasing risk. Legacy environments:

- Limit agility and responsiveness
- Increase operational cost and technical debt
- Slow decision making
- Reduce visibility across the lifecycle

As [aerospace and defense programs become more software-defined](#) and data-driven, disconnected systems and fragmented workflows increasingly limit the ability to manage requirements, verification, compliance, and change with confidence. Capgemini's research on [digital continuity](#) in aerospace and defense highlights the importance of integrating data and information across the product lifecycle to support faster development cycles, production ramp-up, and operational resilience.

Every year spent on legacy ALM compounds future transformation cost and execution risk.

Conclusion: From Fragmentation to Execution Excellence

Aerospace and defense organizations are entering a phase where innovation must be matched by execution certainty. **The differentiator is not only how fast organizations develop advanced systems, but how reliably they can translate complexity into scalable, compliant, and mission-ready outcomes.**

Mission Ready Trace supports this shift by combining PTC Codebeamer as a connected ALM foundation with Capgemini's transformation approach. Together, this helps organizations modernize requirements, verification, compliance, and change management while moving from fragmented lifecycle environments toward controlled execution at enterprise scale.

Modern ALM is therefore not only about improving visibility. It is about creating the structure, traceability, and governance needed to support certification readiness, production ramp-up, and confident program delivery.

The future belongs to organizations that can turn complexity into repeatable, traceable, and controlled execution.