Why *legacy ERP* is slowing down A&D - and what to do about it

You can't scale a *future-ready operation* on a legacy foundation.

ERP systems were designed to bring structure and control to complex operations – and for many years, they did. But over time, those same systems have become a constraint. Customizations piled up, integrations grew brittle, and key functions like engineering and production drifted further apart. Instead of helping teams move faster and work together, ERP is now one of the things holding them back.

These systems weren't built for digital continuity, real-time visibility, or cross-functional collaboration. In an industry and era where speed and precision matter, that gap is getting harder to ignore. Applications running in such systems are usually classified in the Systems of Record layer of the Gartner Pace-Layered application strategy[1].

Modernizing ERP is a chance to reduce technical debt and build true interoperability across disciplines. It's not just a system upgrade – it's a strategic shift in how the business runs.

Doing nothing isn't an option. The challenge is knowing where to start – and how to modernize without disrupting what's already working.

[1] Ref. www.gartner.com/en/documents/1890915

The industry is accelerating.
Can your systems keep up?

The Aerospace and Defense industry is entering a period of accelerated growth across all segments. In civil aviation, the number of aircraft is projected to double over the next 20 years. In defense, the global market is expected to grow at a compound annual growth rate of 6.4% between 2025 and 2029, with the European Union and its member states making substantial investments to enhance industrial readiness. And in space, applications are expected to grow at a pace that outstrips global nominal GDP over the next decade.

Across the board, manufacturers are under increasing pressure to scale operations, deliver faster, and adapt to shifting geopolitical, regulatory, and supply chain realities.

However, the operational backbone of many organizations isn't keeping pace.

Most manufacturers are still working within fragmented and aging system landscapes. Multiple ERPs, siloed PLM and MOM/MES systems, and brittle point-to-point integrations create a lack of visibility, inconsistent data, and limited interoperability. These architectural constraints are not just IT concerns. They impact the entire value chain.

The consequences are felt in every program:

- Delays in propagating design changes across functions
- Difficulty ramping up production or responding to disruptions
- Inability to track product data end-to-end with confidence
- Rising costs linked to rework, inefficiencies, and compliance risk

In short, the systems designed to support production are now limiting it.

But for manufacturers who have begun to modernize, the impact is clear. According to Capgemini research, organizations have achieved:

- **Up to 60% reduction** in engineering change process time through comprehensive impact analysis
- **Up to 75% reduction** in product configuration errors by automating defect logging and documentation
- **Up to 40% increase in productivity and efficiency** for manufacturing engineers
- **5–15% improvement in on-time delivery** driven by better supply chain visibility
- **Up to 80% reduction** in time to prepare shop orders using interactive electronic work instructions with 3D visualization.

These results show what's possible, but only when ERP modernization is treated as the foundation for enterprise-wide integration and data continuity. The next step is building the architecture to make that a reality.

Introducing the digital core for A&D

Digital Core for Aerospace and Defense Manufacturing by Capgemini helps Aerospace and Defense manufacturers move beyond fragmented, siloed systems by integrating the full production tools chain – PLM, ERP, and MOM/MES – into a single, connected architecture.

At the center of the solution is SAP Business Suite and its native capabilities to integrate with any PLM and MOM/MES system. This includes SAP PE&O (Production Engineering and Operations) and third-party MOM/MES platforms via the SAP Business Technology Platform (BTP). The result is a concurrent, bidirectional flow of product data – enabling true cross-functional interoperability and real-time feedback loops between engineering and manufacturing.

Key capabilities include:

For complex environments with multiple ERPs, PLMs, and MES instances, the Capgemini Connect platform provides an additional layer of orchestration. It:

- Establishes and maintains a common ontology across departments to ensure semantic alignment
- Orchestrates structured data flows between systems
- Automates data exchange and monitoring, reducing manual effort and integration risk
- Decouples applications allowing changes in their technologies.

This modular, composable, and data-centric architecture allows A&D organizations to modernize with precision – preserving flexibility while building the foundation for a scalable, compliant, and production-ready enterprise.

Legacy monolithic ERP-based architectures have given way to composable architectures that align business priorities with a flexible, modern IT landscape.

Composable architecture enables modular, side-by-side extensions, seamless integration of best-of-breed SaaS applications, and the incorporation of advanced technologies such as AI, GenAI, and IoT. At the same time, the integration layer has evolved – moving away from rigid point-to-point connections toward event-driven architectures and API-led connectivity. By breaking down complex integration flows into reusable, self-contained components, organizations can simplify upgrades, and foster scalable, secure, and resilient interoperability.

Composable architectures enable:

- New, differentiating usage of existing applications (e.g., GenAI embedded in Business Process)
- Identification of new business models (e.g., subscription models)
- Introduction of innovation and differentiation at a faster pace.

Capgemini' Multi-Pillar S/4HANA architecture is the approach to composable architecture that not only accelerates innovation cycles but also ensures that enterprises remain agile, compliant, and ready to lead in a rapidly evolving industry landscape.

Why the method matters in *Large-scale ERP modernization*

Modernizing ERP in Aerospace and Defense is not a one-time system replacement – it's a multi-phase transformation that must be carefully structured to deliver value without disrupting critical operations.

Capgemini supports this journey through its Large Transformation Program (LTP) method. Developed through deep experience with our clients for decades, the LTP method helps clients define a progressive roadmap that aligns with business priorities while delivering early value and minimizing disruption to ongoing operations.

The transformation is broken into multiple releases and projects, designed to be achievable, governed, and responsive to evolving program needs.

This framework ensures the right focus at every step – from defining business ambition and building the case for change, to establishing the to-be architecture and guiding the transition through well-defined interim states.

By sequencing transformation efforts, the LTP method enables organizations to move forward with confidence – modernizing at pace without compromising continuity, compliance, or production integrity.

LTP

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Rebuilding for *scale, speed, and resilience*

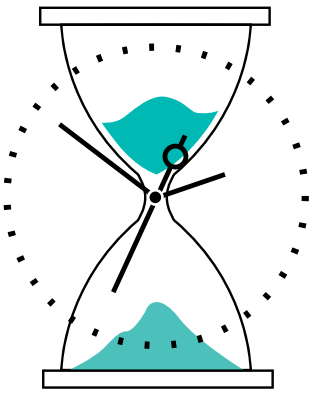
In a sector where speed, precision, and compliance can't be compromised, legacy architectures are no longer fit for purpose. The longer they remain in place, the more they limit visibility, slow down decisions, and increase the risk of failure at critical moments.

This isn't just an IT challenge – it's a business risk.

ERP modernization is an opportunity to move beyond patchwork fixes and build an enterprise that's connected, resilient, and ready to scale. When ERP, PLM, and MES systems work together, data flows, decisions are faster, and teams can operate with confidence.

Modernizing the core isn't about keeping up. It's about creating the conditions to lead.

Start assessing where you are on process, data, architecture and people to decide how to kick- off your roadmap.



About Capgemini

Capgemini is a global business and technology transformation partner, helping organizations to accelerate their dual transition to a digital and sustainable world, while creating tangible impact for enterprises and society. It is a responsible and diverse group of 340,000 team members in more than 50 countries. With its strong over 55-year heritage, Capgemini is trusted by its clients to unlock the value of technology to address the entire breadth of their business needs. It delivers end-to-end services and solutions leveraging strengths from strategy and design to engineering, all fueled by its market leading capabilities in AI, generative AI, cloud and data, combined with its deep industry expertise and partner ecosystem. The Group reported 2024 global revenues of €22.1 billion.

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