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Beyond Localization

The Next Phase of
Saudi Arabia's Aerospace
& Defense Ambition



A&D Global Trends

Background: The leading organizations of the next decade in Aerospace & Defense (A&D) will be distinguished by their ability to calibrate requirements to threat tiers, scale software and autonomy faster than peers, and build an industrial base that delivers at rate.

After three decades of globalized supply chains and platform-centric warfare, six structural shifts are simultaneously reshaping who competes and wins:

- 1** **Product development was reinvented, but the bottleneck has moved**
 Model-Based Systems Engineering (MBSE), digital thread and Modular Open Systems Approach (MOSA) are increasingly AI-augmented and now mature at major primes. The real challenge has shifted to extending these methodologies across the full value chain, where Tier 2/3 suppliers lack the certification frameworks and capital to keep pace.
- 2** **Software is becoming the primary source of defense advantage**
 Defense advantage is shifting from hardware to software — and AI is moving from pilots to operational deployment both inside the platform (autonomy, decision support, mission planning) and across the industrial system that builds it (generative design, AI-augmented engineering, predictive manufacturing). Continuous capability updates are replacing decade-long modernization cycles. Smaller agile firms are playing a growing role alongside traditional primes.
- 3** **Autonomous and networked warfare are evolving in parallel**
 Drones and unmanned systems are becoming core force elements, not complements. Two parallel evolutions are emerging: 6th-gen optionally manned fighters and autonomous swarms. Requirements are being recalibrated to balance high-end platforms with mass low-cost systems, highlighting that the asymmetric-threat equation has changed the math.
- 4** **Localization has become a contract-winning weapon**
 Technical performance alone no longer wins. Winning bids now require a full commercial package: delivery speed, sovereign financing, localization depth, and technology transfer. Governments are converting defense spending into a tool for economic diversification and national champion creation.
- 5** **Resilience is overtaking cost as the supply chain priority**
 Demand is outrunning capacity. The bottleneck has shifted from original equipment manufacturer (OEM) factories to fragile Tier 2/3 suppliers lacking the capital, workforce and certification to scale. New production methods including additive manufacturing, distributed manufacturing, digital twins, AI-driven production planning and quality control, and thermoplastic composites, are reshaping economics.
- 6** **Consolidation and private capital are reshaping the competitive landscape**
 M&A is accelerating as players seek scale. Venture-backed defense tech is emerging as a new industry layer, bringing tech-native talent and software-first business models. Governments are actively backing national champions through direct capital, offsets, and protected procurement.

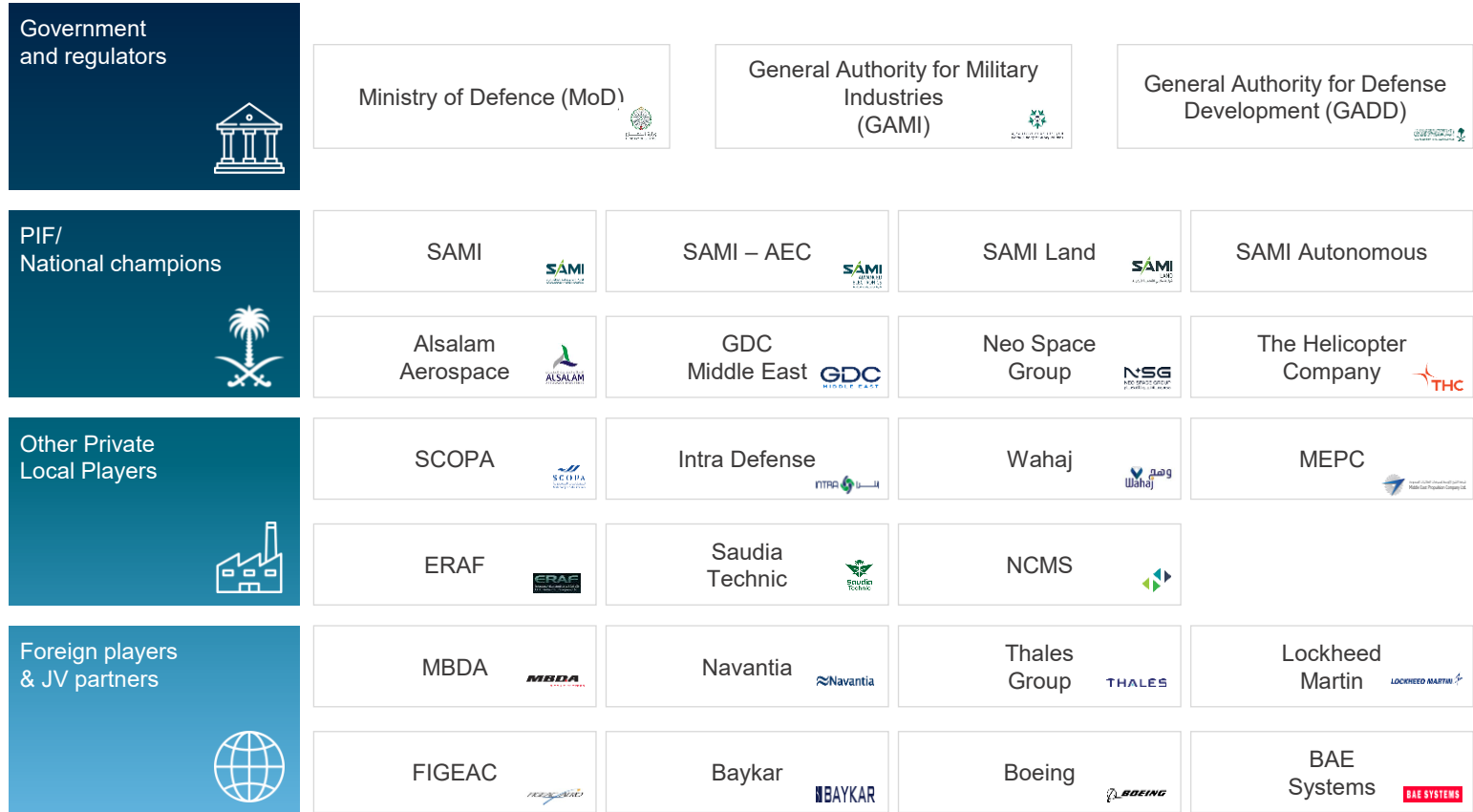


The strategic implication: the operating playbook that worked for the last 30 years no longer applies. Boards and executive teams need to revisit portfolio strategy, industrial footprint, supply-chain architecture and engineering capability simultaneously, not sequentially.

KSA Aerospace & Defense Landscape

Background: Saudi Arabia's A&D ambition under Vision 2030 is reshaping the Kingdom's industrial base. The next phase requires moving beyond localized assembly and building indigenous engineering capability that can translate defense spend into lasting sovereignty, lifecycle value, and an exportable national industry.

Vision 2030 has set a clear target: 50% defense localization by 2030 (vs. ~25% today). PIF and SAMI are the primary vehicles, with joint ventures anchoring platform access and technology transfer through partnerships with global primes. The value chain is developing fast, with maintenance, repair, and overhaul (MRO) already at an advanced stage. The areas where greater focus and acceleration will deliver the highest strategic return sit upstream, across product development and industrialization.



The Kingdom's Aerospace & Defense sector is sovereign-led through direct ownership and mandatory joint ventures, not merely regulation or procurement preference

PIF and SAMI are the primary vehicles for industrial build-out, anchoring capital deployment, JVs and capability development

Portfolio coordination will become increasingly important as JVs raise the need to manage overlaps across capabilities,

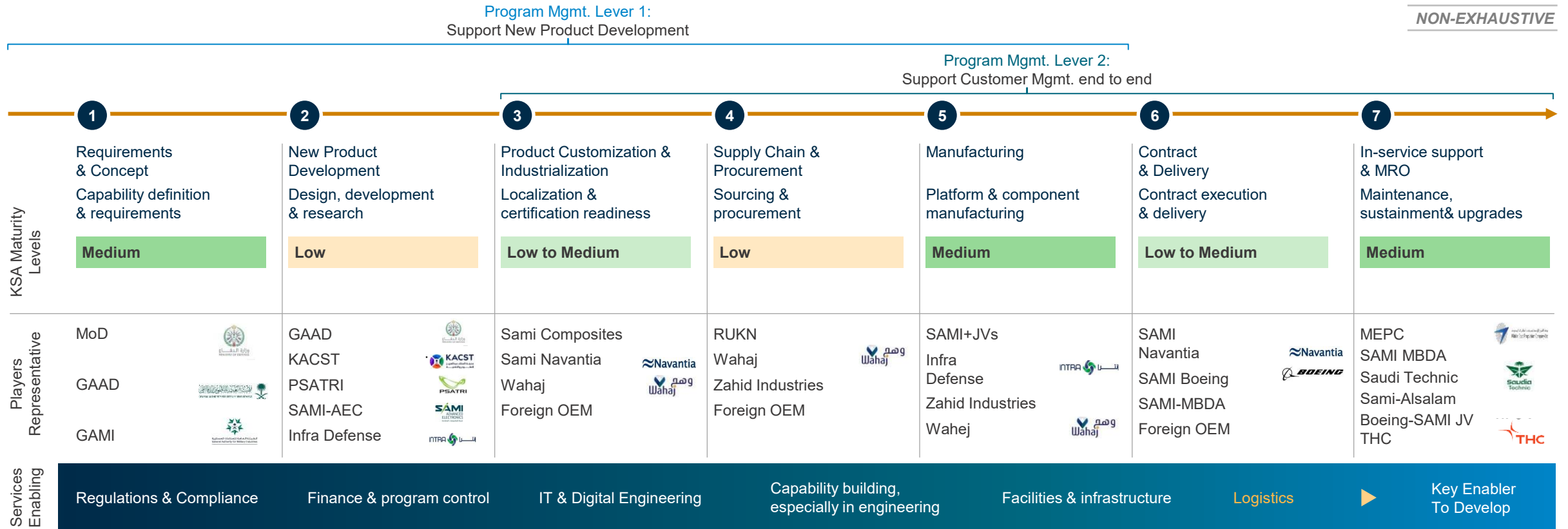
Foreign partners remain critical to platform access and technology transfer

KSA's aerospace and defense ecosystem is state-led, with PIF-backed champions and foreign partners shaping sector development

Where the structural opportunities are emerging

- Air defense & missile localization - tactical missiles, launchers, integration, testing, and sustainment
- Land defense systems - armored platforms, artillery, soldier systems, and C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance) integration
- Naval & maritime systems - surface vessels, naval combat systems, port and coastal defense, and sustainment
- UAV & autonomous systems - platforms, autonomy software, sensors, C-UAS (Counter-Unmanned Aircraft Systems), and mission systems
- MRO & lifecycle services - recurring demand from a large installed base
- Local suppliers & advanced manufacturing - Tier 2/3 ecosystem build-out
- Defense training & capability building - simulation, certification, and OEM knowledge transfer
- Space & satellite systems — Earth observation, communications, and ISR satellites, ground segment integration, and sovereign launch capability development
- Cybersecurity & electronic warfare — cyber defense, EW systems, signal intelligence, and spectrum management, underpinned by a dedicated national regulatory and industrial framework
- Aviation & fixed-wing/rotary-wing platforms — military aircraft and helicopter assembly, modification, and ToT-driven co-production, spanning fast jets, transport, rotary, and special mission platforms

KSA is building presence across the defense value chain, but maturity remains uneven, with MRO being the most advanced step in the value chain.



Where the execution challenges sit

1. Portfolio-to-threat alignment: The ultimate strategic challenge lies in ensuring the complexity and cost of the localized portfolio remain strictly calibrated to the specific threat tiers they must address. Balancing the portfolio requires matching low-cost asymmetric threats with cost-effective countermeasures, ensuring the right response at the right cost point for each threat category.
2. Costly localization ramp-up: limited scale, immature suppliers, and heavy capex.
3. Import-dependent supply chains: recurring delays on critical parts and spares.
4. AI-assisted design, simulation, and V&V tools — combined with KSA's national AI agenda — can materially compress the long lead times traditionally required to master sovereign product development capability
5. Industrial lead-time bottlenecks: long cycles from concept to qualified product.
6. JV/M&A integration complexity: governance, capability transfer, and synergy capture.
7. Weak cost controls: high-cost platforms are hard to sustain without strong cash and maintenance discipline.

Capturing these opportunities requires A&D players to overcome execution challenges across localization, supply chain and program delivery.

Key Challenges	Execution Complexity	Complexity Driver
1  Product portfolio complexity	 Low High	Shifting geopolitical dynamics and threat patterns make it harder to decide which products to localize, co-develop, acquire or import
2  Costly localization ramp-up		Local production can be costlier than imports due to limited scale, supplier maturity, capex and capability-transfer needs
3  Import-dependent procurement & supply chains		Reliance on imported parts creates recurring delays across critical components, spares and MRO services
4  Product design complexity		Complex end-user requirements increase engineering effort, qualification burden and localization cost
5  Industrial lead-time bottlenecks		Long cycles from concept to qualified product limit speed of response to emerging threats
6  JV/M&A integration complexity		JVs and acquisitions create complexity across governance, reporting, capability transfer, synergies and PMI
7  Weak cost controls & asset performance		High-cost platforms and assets are difficult to maintain and utilize efficiently without strong cost, cash and maintenance controls

The key strategic insight

Engineering capability is the medium-term lever for growth. Indigenous engineering captures 30–40% of lifecycle value vs. 5–15% for assembly-only localization. It also reduces strategic dependency, enables modification and upgrade authority, and serves as a prerequisite for moving from a localizer to an exporter.

International benchmarks show that climbing the capability ladder organically takes decades. This progression moves from tooling, through reliability and sustainment, modification and integration, and certification and qualification, up to MBSE-native systems engineering.

Accelerating this timeline is crucial for KSA. Digital product development methodologies including MBSE, digital twins, virtual testing, and AI-augmented engineering can compress requirement-to-market lead times materially. AI in particular shortens the experience gap: it allows junior local engineering teams to operate at proficiency levels that previously required decades of accumulated know-how. This turns capability transfer into a matter of months rather than years, provided the right operating model and governance are in place from day one.

A&M PoV: Defense sovereignty starts with indigenous engineering capability, and digital product development can help build it faster.

	Capabilities must be built in sequence	Illustrative benchmark Turkey	Why this matters for KSA
<p>Least Complex</p> <p>Most complex</p>	<p>1 Level 1 Tooling & Manufacturing Engineering</p> <p>Tool design, GSE engineering, calibration / metrology</p> <p>Build time 3–5 years</p>	<p> 1985–1995 Level 1</p> <ul style="list-style-type: none"> TAI established with Lockheed Martin partnership (1984) F-16 license production begins (1987) ASELSAN and Roketsan scale early production <p>What was built: Tooling, manufacturing engineering and basic component production</p>	<p>1 Higher-value localization</p> <p>Engineering captures 30–40% of lifecycle value vs. 5–15% for assembly-only localization</p>
	<p>2 Level 2 Reliability & Sustainment Engineering</p> <p>FMECA, LORA, MSG-3 analysis</p> <p>Build time 5–7 years</p>	<p> 1995–2005 Level 2</p> <ul style="list-style-type: none"> F-16 depot-level MRO begins SSM established as localization authority (1996) UH-60 co-production and radar/EW systems scale <p>What was built: Depot MRO, FMECA/LORA/MSG-3 and lifecycle sustainment</p>	<p>2 Reduced strategic dependency</p> <p>A shift from foreign-designed/Saudi-operated to Saudi-modified/Saudi-sustained reduces reliance on external approval</p>
	<p>3 Level 3 Modification & Integration Engineering</p> <p>STC engineering, mission systems and weapons integration</p> <p>Build time 7–10 years</p>	<p> 2005–2015 Level 3</p> <ul style="list-style-type: none"> T-129 ATAK program launched (2007) F-16 modernization with indigenous input (2010) Hürkuş, TB2 and ANKA programs emerge <p>What was built: Modification engineering, mission systems and avionics/weapons integration</p>	<p>3 Modification and upgrade authority</p> <p>Sovereign engineering lets KSA extend platform life, capture IP value and reduce OEM upgrade dependency</p>
	<p>4 Level 4 Certification & Qualification Engineering</p> <p>Test engineering, qualification authority, indigenous airworthiness</p> <p>Build time 10–12 years</p>	<p> 2015–2020 Level 4</p> <ul style="list-style-type: none"> TF-X/KAAN launched (2016) TB2 export sale (2017) Military airworthiness capability established <p>What was built: Modification engineering, mission systems and avionics/weapons integration</p>	<p>4 Regional engineering hub potential</p> <p>KSA could provide modification, integration and sustainment services across the GCC and nearby operators</p>
	<p>5 Level 5 Systems Engineering & Architecture (MBSE)</p> <p>Requirements management, architecture design, MBSE-native programs</p> <p>Build time 12–15 years</p>	<p> 2020–2025 Level 5</p> <ul style="list-style-type: none"> Akıncı becomes operational (2022) KAAN maiden flight and Hürjet first flight (2023) Defense exports exceed \$7B annually <p>What was built: Indigenous program capability and exportable engineering IP</p>	<p>5 Foundation for export competitiveness</p> <p>Sovereign engineering is the prerequisite for SAMI to evolve from localizer to exporter</p>

Some Representative Industry Case Studies

Background: Across two decades of A&D engagements, the same pattern repeats i.e., value is captured during execution, not strategy. Disciplined PMO, senior operators on the ground, and ready-made tools are what move the needle.

Five anonymized cases from the field.

Case 1 - Tier 1 aerostructures supplier

Faced with a negative EBIT, a persistent productivity gap, and a tight parent-company integration deadline, the client launched a company-wide transformation. This effort was led by a dedicated PMO covering blue/white-collar efficiency, central function streamlining, direct/indirect procurement optimization, and selective transfer/outsourcing/insourcing of work packages.

Case 2 - Market-leading Space OEM losing competitiveness on purchased materials

Challenged by aggressive competitors, a government-supplier culture blocking commercial best practices, and programs run as "one-offs", the organization implemented a comprehensive turnaround strategy. This included a deep supply-chain maturity assessment, a complete redesign of the Procurement-Engineering interface, and a PMO managing engineering and material workstreams in parallel.

Case 3 - Post Merger Integration after national champions merger

The integration required merging two legacy, cross-border product development organizations characterized by different cultures, processes, and tools. The PMI focused primarily on people, building cross-border engineering teams supported by common design methodologies. Additionally, a robust performance management layer was established around engineering KPIs to give leadership real-time visibility into productivity, cost, and time-to-market across the combined organization.

Case 4 - MRO during a major liquidity crisis

Faced with a liquidity crisis triggered by delayed customer payments, a collapse in traffic, and supplier distress, the organization implemented an immediate stabilization plan. This included establishing a 13-week cash flow forecast in coordination with finance, supporting the CFO to secure lender relationships, and developing a 18-month demand re-forecast. This projection was flowed down to manufacturing and sourcing to right-size the operating base.

Case 5 - UAS manufacturer needing a 500%+ rate increase in 6 months

After winning a large production contract, the organization lacked manufacturing maturity. To address this, a rapid turnaround was executed by combining the rollout of a Management Operating System (including tiered daily management, SI&OP, make-vs-buy, and change control) with the design and stand-up of a new, vertically integrated facility in under three months.

The pattern across all these five case studies:



A clear, fact-based diagnostic before any commitment to action



A PMO that mirrors every workstream and manages dependencies



Senior operators embedded in the client organization



Ready-made tools, dashboards and KPIs deployed from week one



Hands-on execution support

This is what "performance improvement" actually looks like when applied to A&D.

Why A&M is a valuable partner in A&D

Background: Most consulting firms give you a strategy. A&M helps you deliver it. That difference, applied to A&D, compounds into measurable industrial outcomes.

Three things set A&M apart in this sector:

- 01 **Core business focus over peripheral support.** We focus on core product development, enhancing methodologies and processes by increasingly leveraging AI across design, simulation, and manufacturing, to shorten lead times, reduce product costs, and maximize design robustness. This enables us to identify the right operating model to maximize local knowledge transfer. We are at the core of supply chain and manufacturing operations, not only improving existing landscapes, but also designing facilities (e.g. logistic networks, and plants) to optimize performance.
- 02 **Operators rather than advisors.** Our senior team comprises former CFOs, COOs, engineering directors, and program leaders. We diagnose problems from the inside, offering an operational perspective that traditional advisors lack.
- 03 **Execution, not only decks.** We lead the PMO, sit in the cash flow war room, manage factory relocations, and take interim roles when needed. Value is captured during execution and that is where we operate.

We serve our clients with an integrated capability set built for A&D. Operating Model, CFO Services, Product Strategy, Localization & Supply Chain, MRO Operational Efficiency, PMI & Value Creation, and PMO & Execution — delivered as one team, not as disconnected workstreams.

A&M can support across seven capability areas required to scale localization and MRO performance:

<p>01 Operating Model</p> <ul style="list-style-type: none"> ▪ Target operating model design ▪ Board & operating committees ▪ Engineering capability build up ▪ Ecosystem, sourcing & workforce model <p>Case example: redesigned engineering, production and procurement model for a fixed-wing aerospace player, reducing time-to-market by 15% and product cost by 12%.</p>	<p>02 Value Creation & PMI</p> <ul style="list-style-type: none"> ▪ Target scouting & screening ▪ Due diligence & deal structuring ▪ Value creation planning ▪ PMI & synergy capture <p>Case example: led helicopter OEM product-development PMI, reducing key system costs by 25% and doubling production rates.</p>	<p>03 Product Strategy</p> <ul style="list-style-type: none"> ▪ Product portfolio assessment ▪ Local demand & export potential ▪ Offset credit weighting ▪ Capex & headcount implication <p>Case example: design and implementation of “product family concept” to increase standardization level across different rotary wing vehicles to reduce product costs and time-to-market for developing new platforms/variants</p>
<p>04 Localization & Supply Chain</p> <ul style="list-style-type: none"> ▪ Product Development optimization ▪ Buy vs localize framework ▪ Supplier selection & development ▪ Offset/analysis ▪ Industrial footprint & capability transfer <p>Case example: redesigned Space OEM procurement and engineering, delivering 20%+ reductions in major OpEx categories.</p>	<p>05 MRO Operational Efficiency</p> <ul style="list-style-type: none"> ▪ Inventory & spare parts mgmt. ▪ Labor productivity ▪ Turnaround time improvement ▪ Quality control <p>Case example: improved airline MRO planning, spares and labor efficiency, reducing turnaround time by ~50% in pilot areas.</p>	<p>06 CFO Services</p> <ul style="list-style-type: none"> ▪ Interim CFO support ▪ Reporting, close & project cost control ▪ Financing & credit facilities ▪ Cost-base and cash optimization <p>Case example: stabilized a PE-owned French MRO through cash forecasting, lender support and capacity resizing during a liquidity crisis.</p>
<p>07 PMO & Execution Support Cross-cutting program mgmt. and execution support across all phases and capability areas</p>		

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ABOUT ALVAREZ & MARSAL

Founded in 1983, Alvarez & Marsal is a leading global professional services firm. Renowned for its leadership, action and results, Alvarez & Marsal provides advisory, business performance improvement and turnaround management services, delivering practical solutions to address clients' unique challenges. With a world-wide network of experienced operators, world-class consultants, former regulators and industry authorities, Alvarez & Marsal helps corporates, boards, private equity firms, law firms and government agencies drive transformation, mitigate risk and unlock value at every stage of growth.

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