

**Solution Overview**

SAP for Aerospace and Defense

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Executive  
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# Aerospace and Defense: Aftermarket Services



## Profitable Delivery of Services

### Profitable Service Delivery

#### Best-in-Class Services

#### Competitive Advantage

#### SAP Innovations

Competing in the aftermarket has never been more challenging for aerospace and defense (A&D) manufacturers. Profitable growth requires differentiation from competitive offerings and highly efficient operations to keep costs low.

In an environment where defense contractors are being asked to cut costs and commercial manufacturers are stretched to their production limits, the commercial and defense segments of the aerospace and defense market couldn't be more different. Despite these differences, the aftermarket services business remains strategic for both segments due to its potential for profitability and future growth. Profitability for aerospace and defense service providers in both segments will rely heavily on leading-edge technologies in the areas of enterprise mobility, in-memory computing, and product visualization to achieve maximum efficiency in the delivery of parts and services.

In addition, complete process integration is essential from planning through to execution and fulfillment of part and service orders. This integration is necessary for complying with service-level agreements and keeping customer satisfaction as high as possible to remain competitive in the market.



## Delivering Best-in-Class Services

Profitable Service Delivery

**Best-in-Class Services**

Competitive Advantage

SAP Innovations

The shift toward services has resulted in a dramatic change for aerospace and defense companies. Aftermarket services offer high margin potential when compared to the manufacturing and sale of capital equipment. This opportunity for higher margins drives the need for a best-in-class service offering.

Success in the aftermarket requires that aerospace and defense companies recognize the service as the product. As such, service offer differentiation and efficient delivery of services will determine profitability. The greatest differentiator in this business is the quality of customer service.

Equipment operators have choices when it comes to purchasing repair services and spare parts. There are many third-party maintenance repair shops and aftermarket parts vendors that are competing for this business. As a result, aerospace and defense companies must offer best-in-class interaction with their customers.

Efficient service delivery is also paramount. Whether you are providing repair services or running a service parts business, process integration and the application of leading-edge technologies will streamline operations and reduce cost of delivery. Leading-edge technologies in the areas of enterprise mobility, in-memory computing, and product visualization are key enablers.

## Gaining a Competitive Advantage

Profitable Service Delivery

Best-in-Class Services

**Competitive Advantage**

SAP Innovations

The stakes are high for aerospace and defense manufacturers. Capital equipment has traditionally been a low-margin segment. Aerospace and defense aftermarket services offer the potential to raise company returns. Winning market share in this segment is essential in maximizing company profitability.

To gain market share and maximize profitability in the aftermarket, aerospace and defense manufacturers must perfect core competencies in program management, customer service, maintenance operations, and supply chain management.

The ability to model customer contracts, plan cost and revenue baselines, and track actual performance is fundamental. Program managers must have visibility into key performance indicators (KPIs) to ensure profitability.

Delivering best-in-class customer service provides differentiation from the competition. Improving interaction with customers is the goal. This is done by arming service representatives with all the information they need to address customer inquiries without escalation.

Enabling efficient maintenance operations is also mandatory. The ability to efficiently plan, schedule, and execute repair orders keeps costs low and protects margins. Enabling technologies like visual work instructions increase this efficiency.

Complexity in the aftermarket supply chain makes delivering the right part to the right place at the right time a challenge. Profitability in the service parts business requires tight integration across planning, procurement, warehousing, and fulfillment.



## SAP Innovations

Profitable Service Delivery

Best-in-Class Services

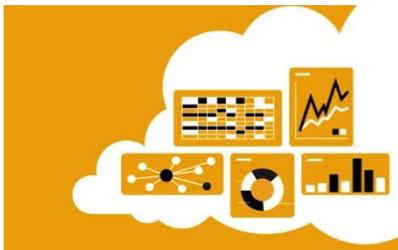
Competitive Advantage

### SAP Innovations

From high-flying aircraft to advanced avionics, leading-edge technology is at the heart of the aerospace and defense industry. SAP technology can streamline existing operations and facilitate the creation of entirely new solutions.

Aerospace and defense companies are saturated with data from deep supply chains, complex engineering processes, and even the sensors and intelligence products they themselves build. Breakthrough in-memory computing solutions, along with advanced analytics, turn this data into actionable information available at any level of granularity. Product visualization further exploits this data by transforming it into an intuitive format that elevates your enterprise to new levels of productivity. Finally, mobile solutions from SAP instantly deliver the most relevant information where it's needed in the organization.

These same technologies represent an opportunity to unlock totally new streams of revenue. Embedding the SAP HANA platform into your products allows you to create lightning-fast C4ISR applications and innovative solutions that optimize maintenance, provide for cybersecurity, and detect fraud, waste, and abuse.



## Focus on the Right Core Competencies

### Aftermarket Services

Manage the Program

Manage Customer  
Interaction

Manage Maintenance  
Operations

Manage the Supply Chain

To gain market share, aerospace and defense firms must perfect core competencies in program management; customer service; maintenance, repair, and overhaul (MRO); and supply chain management.



#### Manage the Program

Model customer contracts, plan cost and revenue baselines, and track actual performance.



#### Manage Customer Interaction

Arm service representatives with all the information they need to address customer inquiries without escalation.



#### Manage Maintenance Operations

Efficiently plan, schedule, and execute repair orders to keep costs low and protect margins.



#### Manage the Supply Chain

Profitability in the service parts business requires tight integration across planning, procurement, warehousing, and fulfillment.

## Manage the Program

Aftermarket Services

**Manage the Program**

Manage Customer  
Interaction

Manage Maintenance  
Operations

Manage the Supply Chain

The ability to model customer contracts, plan cost and revenue baselines, and track actual performance is fundamental. Program managers must have visibility into program KPIs to ensure profitability.

This element of aftermarket services' value chain is the most fundamental, because first and foremost, aerospace and defense aftermarket service contracts, especially performance-based logistics contracts, are typically very complex and highly regulated. Therefore, program managers need tools to better manage program cost, risk, and performance. This requirement starts with a need for tight integration between the logistical project and the legal contract modeled in the system.

The program manager must be able to establish and maintain the program performance baseline, and more important, compare this baseline to actual performance that is captured through the execution of logistical processes. Maintaining this visibility through advanced analytical tools is the key to managing risk and achieving profitability.



## Manage Customer Interaction

Aftermarket Services

Manage the Program

**Manage Customer  
Interaction**

Manage Maintenance  
Operations

Manage the Supply Chain

# 15.3%

Faster response times where  
agents have access to service  
history and other customer  
information

Source: SAP Performance  
Benchmarking

Delivering best-in-class customer service provides differentiation from competitive offerings. Improving interaction with customers is the goal. This is done by arming service representatives with all the information they need to address customer inquiries without escalation.

Aerospace and defense OEMs realize their customers have choices when it comes to purchasing repair services and spare parts. When equipment is sold to an operator, this does not guarantee that the operator will leverage the OEM for lifecycle support. There are many third-party maintenance repair shops and aftermarket parts vendors that are competing for this business. As a result, aerospace and defense OEMs must differentiate themselves in the market by improving their interaction with customers.

This is done by arming their service representatives with all the information they need to address their customers' inquiries and requests without escalation. They must provide their customers with multiple self-service interaction points to easily find the right information at the right time. They also need to make their field technicians more efficient by arming them with the capabilities to complete their tasks in one visit, with all the information they need at their fingertips.



## Manage Maintenance Operations

Aftermarket Services

Manage the Program

Manage Customer  
Interaction

**Manage Maintenance  
Operations**

Manage the Supply Chain

Enabling efficient maintenance operations is mandatory. The ability to efficiently plan, schedule, and execute repair orders keeps costs low and protects margins. Enabling technologies in the areas of 3-D product structures, visual work instructions, and enterprise mobility will increase process efficiency.



The goal when delivering maintenance services is to maximize equipment availability. To do this, maintenance processes must be completely integrated across engineering, planning, and execution. Aviation authorities require compliance and traceability when implementing engineering changes. This requires management capability, tracking, and visibility of engineering orders from planning through to embodiment. All planning horizons must be considered as well. Given that the different horizons have different objectives and characteristics, maintenance planners must have flexibility to aggregate and visualize capacities and material requirements across different planning horizons.

From an execution point of view, technicians on the shop floor require the most flexibility to perform their jobs. From documenting work, displaying instructions, and executing repair dispositions to recording labor hours, technicians must have simplicity and ease of use on the shop floor.

## Manage the Supply Chain

Aftermarket Services

Manage the Program

Manage Customer  
Interaction

Manage Maintenance  
Operations

**Manage the Supply Chain**

Complexity in the aftermarket supply chain makes delivering the right part to the right place at the right time a challenge. Profitability in the service parts business requires tight integration across planning, procurement, warehousing, and fulfillment.



The aftermarket supply chain is typically a very complex multitier network that requires the movement of parts both horizontally and vertically throughout the network. The manufacturing supply chain, by contrast, is more linear and predictable in nature. This difference is primarily the result of the reverse logistics process that is necessary to support the return of repairable parts and the requirement to satisfy highly variable material demands for both slow-moving, expensive assemblies and fast-moving, inexpensive spare parts.

Profitability in the aftermarket service parts business requires tight integration across all domains including planning, procurement, warehousing, and fulfillment. This integration is essential to ensure that the process of fulfilling customer requirements is connected from beginning to end.

## A&D Aftermarket Services Value Map

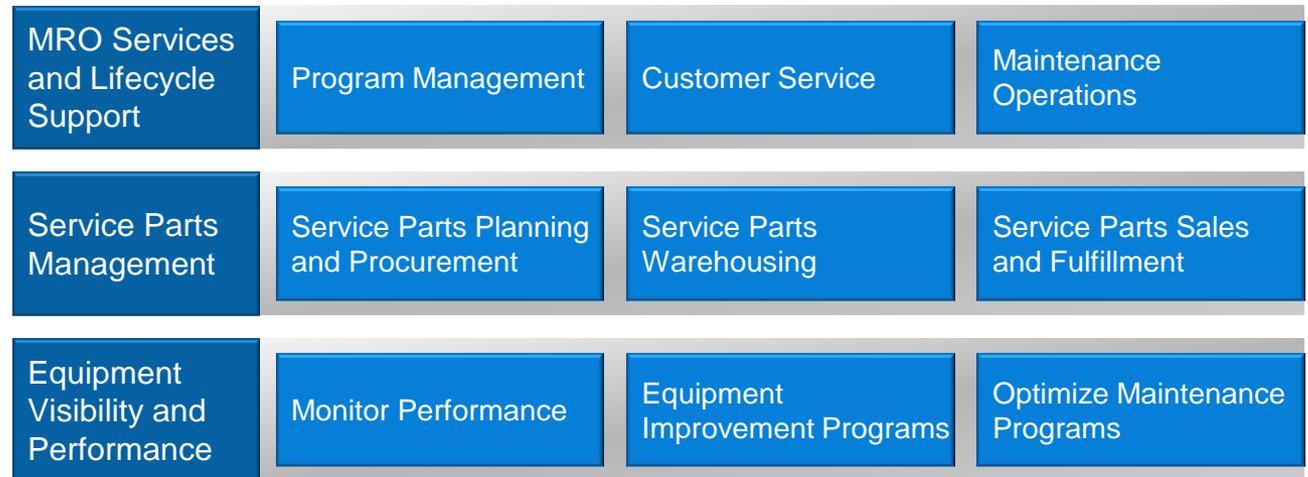
### SAP Solutions

Services and Support

Service Parts Management

Visibility and Performance

**SAP solutions address key requirements of aerospace and defense aftermarket services.**



## MRO Services and Lifecycle Support

SAP Solutions

### Services and Support

Service Parts Management

Visibility and Performance

### Efficient internal operations and customer interactions.

The maintenance, repair, and overhaul solution from SAP enables holistic coverage for the entire repair services business. Program management and maintenance operations functionality facilitates internal operations, and external customer interactions are enhanced through customer service features.



#### Program Management

Tightly integrated project and logistics execution systems help ensure timely, consistent information on performance. This enables proactive management and helps assure delivery against service-level agreements.

#### Customer Service

A single platform enables management and execution of the end-to-end service process for customers, customer service representatives, and field service technicians. This keeps costs low and customer satisfaction high.

#### Maintenance Operations

Complete integration across maintenance engineering, planning, execution, and support functions helps ensure safe, compliant, and efficient delivery of MRO services.

# 29%

Lower service and maintenance costs where all facilities track and analyze standardized asset management KPIs

Source: SAP Performance Benchmarking



## Service Parts Management

SAP Solutions

Services and Support

**Service Parts Management**

Visibility and Performance

### Get the right parts to the right place at the right time.

A profitable service parts business is enabled through smooth integration of core processes in the areas of sales, fulfillment, planning, procurement, and warehousing.



#### Service Parts Planning and Procurement

Determine trade-offs between inventory costs and service-level targets. Provide inventory visibility across the whole service parts supply chain. Properly plan inventory across a distribution network. Collaborate on business processes with suppliers.

#### Service Parts Warehousing

Efficiently store and retrieve material to optimize warehouse operations. Validate warehouse movements using bar-code scanning on radio frequency devices and RFID tag systems. Support slotting and cross-docking processes to reduce material “touches.”

#### Service Parts Sales and Fulfillment

Support global sourcing and parts price optimization. Enable third-party order processing to support the outsourcing of storage and handling to parts suppliers.

## Equipment Visibility and Performance

SAP Solutions

Services and Support

Service Parts Management

**Visibility and Performance**

### **Optimize maintenance and maximize equipment availability.**

Maximizing equipment availability requires the monitoring of KPIs related to system health, the identification and execution of equipment design changes for continuous improvement, and the optimization of maintenance programs to keep costs low.



#### Monitor Performance

Enabling a shared view of equipment performance for operations and maintenance aids the evaluation of cost and safety risks. Role-based dashboards to monitor relevant KPIs and generate alerts facilitate the proactive identification, correction, and prevention of failures.

#### Equipment Improvement Programs

The timely identification and execution of equipment engineering changes will improve operational availability and safety, and reduce total lifecycle costs. Process reviews against benchmarks will highlight ways to improve performance and avoid equipment failure.

#### Optimize Maintenance Programs

Evolving and optimizing asset management strategies helps ensure that asset capabilities meet operational demands throughout their lifecycle.

## SAP Innovations

### SAP Innovations

SAP HANA

Mobile

Analytics

Product Visualization

The growth in commercial aerospace demands that manufacturers scale to meet customer requirements, while shrinking defense budgets mean that defense contractors must find new sources of revenue and pursue operational efficiency. Technology can help the aerospace and defense industry to thrive in this environment.



# 80%

Of decision makers think access to the right information at the right time is critical to their business

Source: SAP Performance Benchmarking

### SAP HANA

The ability to perform predictive analysis across large volumes of data increases equipment availability and reduces total cost of ownership.

### Mobile

Mobile solutions instantly deliver the most relevant information anytime, anywhere.

### Analytics

Advanced analytics turns data into actionable information available at any level of granularity when combined with in-memory solutions.

### Product Visualization

Product visualization exploits data by transforming it into an intuitive format that elevates enterprises to new levels of productivity.



## SAP HANA

SAP Innovations

**SAP HANA**

Mobile

Analytics

Product Visualization

Aerospace and defense IT in general is about using technology to maximize the value of the mountains of information that aerospace and defense companies collect and store. With the SAP HANA platform, aerospace and defense manufacturers can analyze business operations based on large volumes of detailed information as it is created.



### Equipment Improvement Programs

Identifying improvement programs that enhance the reliability and maintainability of equipment requires the interrogation and analysis of large volumes of data from both logistics and condition monitoring systems. The ability to bring this data together into one platform for analysis and the prediction of future events are the keys to identifying opportunities for equipment improvement.

### Customer Service

Customer service representatives need quick, reliable access to large volumes of customer and equipment data to solve customer issues on the first contact, without escalation. Response times must be in compliance with service-level agreement performance thresholds to reduce latency. Interrogating vast amounts of customer and equipment data from both internal systems and on the Web gives representatives the context to service customers quickly and within acceptable performance thresholds.

# 53%

Of organizations report a big gap between the availability of Big Data and their ability to analyze it for insights

Source: SAP Performance Benchmarking

## Mobile

SAP Innovations

SAP HANA

**Mobile**

Analytics

Product Visualization

# 22%

Fewer days in inventory when companies use a mobile warehouse/inventory solution

Source: SAP Performance Benchmarking

Provide the latest information where and when it is needed most to improve operational efficiency and customer satisfaction.



### Maintenance Operations

Increase productivity for maintenance technicians by enabling visibility and work execution on mobile devices. Enable visibility of equipment structures, repair history, work order details, and material requirements. Enable efficient work execution activities such as time recording, work order confirmations, and material consumption.

### Customer Service

Increase productivity for field service technicians with mobile devices by providing all relevant service order information at their fingertips. Increase billable hours by streamlining communications with the back office and by capturing accurate data from service order execution while on-site at the customer's facility.

### Service Parts Warehousing

Enterprise mobility increases productivity for warehouse personnel by speeding material receipts, physical inventory counts, availability checks, and material redistribution.

## Analytics

SAP Innovations

SAP HANA

Mobile

**Analytics**

Product Visualization

Enable an intelligent aerospace and defense organization by providing up-to-the-minute visibility into KPIs across every facet of business operations, enabling real-time monitoring, root cause analysis, risk mitigation, and predictive modeling.



### Program Management

Deliver complete visibility across disparate systems supporting aerospace and defense aftermarket programs. Track and compare actual performance to program baselines to help ensure compliance with program-level KPIs and aftermarket service business profitability.

### Customer Service

Gain real-time insights into your service operations without the need for IT support. Capture and analyze customer and equipment status data to enhance service offerings for increased profitability and improved customer satisfaction.

### Maintenance Operations

Identify and monitor KPIs related to maintenance operations. Evaluate operational schedules against maintenance requirements to minimize equipment downtime and optimize equipment availability.

# 26%

Higher inventory turns with  
warehouse analytics from  
SAP

Source: SAP Performance  
Benchmarking

## Product Visualization

SAP Innovations

SAP HANA

Mobile

Analytics

**Product Visualization**

As IT transforms from a supporting function into a strategic driver, new product visualization solutions leverage engineering design data to elevate your aftermarket services business to new levels of productivity.



Customer  
Service

### Customer Service

Improve customer satisfaction by giving customers the ability to order parts via intuitive visual part catalogs. Accelerate service order execution in the field by leveraging illustrated parts catalogs for part identification and ordering.

Maintenance  
Operations

### Maintenance Operations

Reduce repair turnaround times and increase equipment availability by giving maintenance technicians visual work instructions for training and work order execution.

## Customer Co-Innovation

### Best-Run Customers

Bombardier

Northrop Grumman

A leading US defense  
contractor

Why SAP?

SAP co-innovates with leading aerospace and defense companies to drive industry priorities. These include managing complex customer programs, designing and building complex products, maintaining a responsive supply chain, and delivering aftermarket services.

### Executive Advisory Council and User Groups

SAP uses the Aerospace and Defense Industry Advisory Council, the SAP User Group for Airlines (SUGAIR), and Americas' SAP Users' Group (ASUG) to drive co-innovation for aerospace and defense.

### Co-innovation Partners

The aerospace and defense ecosystem consists of consulting and integration partners as well as value-added co-innovators and developers.

# BOMBARDIER

Best-Run Customers

**Bombardier**

Northrop Grumman

A leading US defense contractor

Why SAP?

**Montreal-based Bombardier Aerospace had pressures in its parts logistics organization with rising inventory levels and unpredictable demand. To stay on top of its game, it improved its repair and replacement service for returned parts. SAP Business Suite software assisted, providing insight into inventory levels.**

Bombardier needed to gain insight into unpredictable and sporadic demand from a multitude of sources, to operate effectively within a dynamic and uncertain environment. Its key objectives were to introduce end-to-end, closed-loop planning and execution, increase service levels and fleet availability, and reduce the growth rate of the service parts inventory.

The company implemented the first global solution for spare parts planning integrated with spare parts inventory and global available-to-promise functionality for the aerospace and defense industry, entering global service supply chain and all service parts in the SAP Supply Chain Management application, thus leveraging one strategic platform that supports planning, execution, warehousing, and collaboration needs.

“Our implementation journey with SAP Service Parts Planning for Aerospace and Defense has rejuvenated Bombardier’s aftermarket organization, leading to numerous process improvements and system efficiencies.”

Nishant Choudhry, Solution Advisor, Bombardier Aerospace

**15%**

Reduced service inventory growth



Increased service levels



Maintain optimal inventory levels in the distribution network

**1**

Provide a single integrated platform for engineering, customer service, and supply chain operations



## **NORTHROP GRUMMAN**

Best-Run Customers

Bombardier

**Northrop Grumman**

A leading US defense contractor

Why SAP?

### **Northrop Grumman – a world leading defense contractor delivering innovative solutions that range from undersea to outer space and into cyberspace**

In the face of increasing budget pressures, Northrop Grumman needed to think and act differently to improve operational efficiency and further improve product quality. In addition to the broad deployment of SAP Business Suite, Northrop Grumman now leverages SAP Visual Enterprise across half of their business in support of manufacturing, training, and technical documentation.

#### **Key Benefits**

- Improve data consistency across departments and functions
- Reduce labor hours – work with up-to-date 3D graphics, not out-of-date paper manuals
- Reduce cost – reuse of graphics for multiple downstream purposes

“Where SAP Visual Enterprise is used, our delivery times have been reduced by 15-20% due to less rework and more efficient operations.”

John Patrick Batache, Director of Lifecycle Logistics and Support,  
Northrop Grumman

**15-20%**

Improved delivery times



Significant cost savings over 5 years



Fewer errors, improved accuracy

## A leading US defense contractor

Best-Run Customers

Bombardier

Northrop Grumman

**A leading US defense contractor**

Why SAP?

**A leading US defense contractor that provides solutions for the Aerospace & Defense manufacturing and aftermarket services industries.**

In an environment where defense contractors are being asked to cut costs and commercial manufacturers are stretched to their production limits due to record backlogs, efficient analysis of business data is a critical capability to ensure profitability now and into the future.

Looking to dramatically improve agility and access to information the company is now moving beyond it's widely deployed SAP Business Suite and has implemented the SAP HANA platform to perform this critical analysis for 90% of it's revenue base. This platform lets managers develop regional and geographic perspectives about sales and application trends and develop strategies that support growth around the world.

**1000x**

Faster generating cost & profitability reports



Rapid business decisions

**80**

Sites deployed globally

“HANA allows us to get ahead of customer needs,” . . . “this is clearly transformational.”

Vice President – Marketing & Product management



## Why SAP?

Best-Run Customers

Bombardier

Northrop Grumman

A leading US defense  
contractor

**Why SAP?**

SAP solutions enable the agile aerospace and defense enterprise to quickly respond to a dynamic marketplace and execute complex business processes with speed and precision.

### **Comprehensive Business Solutions**

SAP offers the most comprehensive portfolio of industry-tailored solutions for the aerospace and defense industry. From program management to manufacturing to aftermarket services, SAP can help aerospace and defense customers achieve excellence with smoothly integrated solutions.

### **Leveraging Key Breakthrough Innovations**

The SAP solution portfolio is based on the industry's most innovative technology foundation, including SAP HANA, mobile solutions, analytics, and cloud solutions, to enable business process optimization and efficiency at the lowest possible cost.

### **40 Years of Delivering Value to aerospace and defense**

The world's leading aerospace and defense companies, across every segment of the industry throughout the world, continue to rely on SAP to enable every aspect of their business.



## Find Out More About How Your Organization Can Become Best-Run

### Benchmark Your Performance

Position your organization for dominance in this new economy with the business performance benchmarking program from SAP – available free to SAP customers and select prospects. SAP’s benchmarking program has helped more than 3,000 organizations assess their strengths, uncover areas for improvement, and identify best practices and IT strategies that generate clear, tangible value – not someday, but today.

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