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The Airbus DS in-service digitalization



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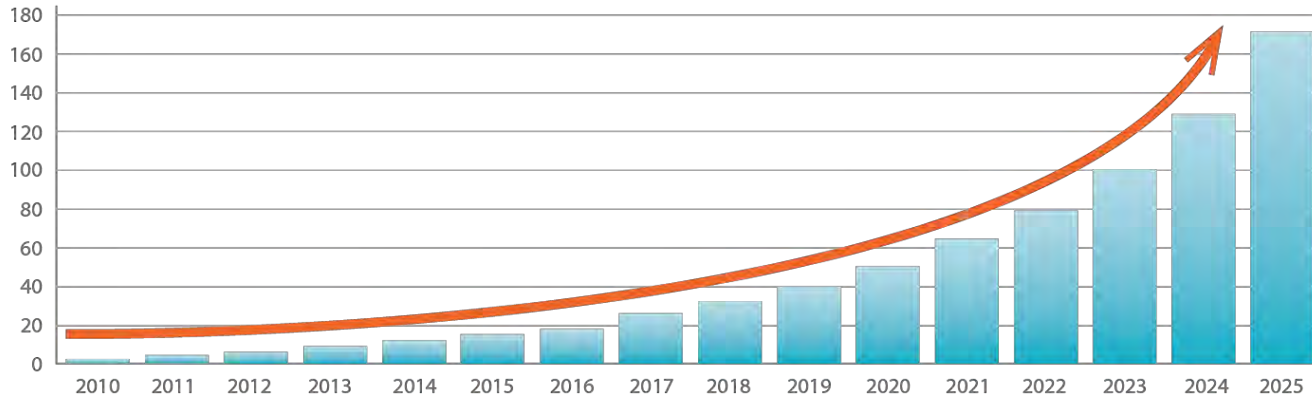
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The 4th Industrial Revolution – Data Creation

“Data is **helping** us reach new markets, **better** serve existing customers, streamline operations, and monetise raw and **analysed data**” (*)

Annual Size of the Global Datasphere



From **33 Zettabytes** in **2018**

↓

To **175 Zettabytes** by **2025 (**)**

Source (*): Data Age 2025, sponsored by Seagate with data from IDC Global datasphere, Nov 2018
<https://www.seagate.com/files/www-content/our-story/trends/files/idc-seagate-dataage-whitepaper.pdf>
 (**) 1 Zettabyte = 1 Trillion Gigabytes

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So what is Smartforce?

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SmartForce is an evolving Airbus portfolio of Digital Services that solve the present and future needs of governmental customers through collaborative development of services based on data sharing and new technologies

SmartForce aims to:

- Maximise fleet availability and optimise the maintenance effort
- Enable rapid and robust decision-making whilst controlling costs



SmartForce Benefits

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- The development of new technologies are used to enable a fresh approach to established practices in order to increase efficiency
- SmartForce capitalises on the new power of big data analytics coupled to secured connectivity to maximise your mission readiness
- Exploiting the data gathered, we can assess, predict and anticipate, in order to produce the intelligence and advice to be better prepared for eventual technical issues



Increasing
fleet availability



Increasing
mission readiness

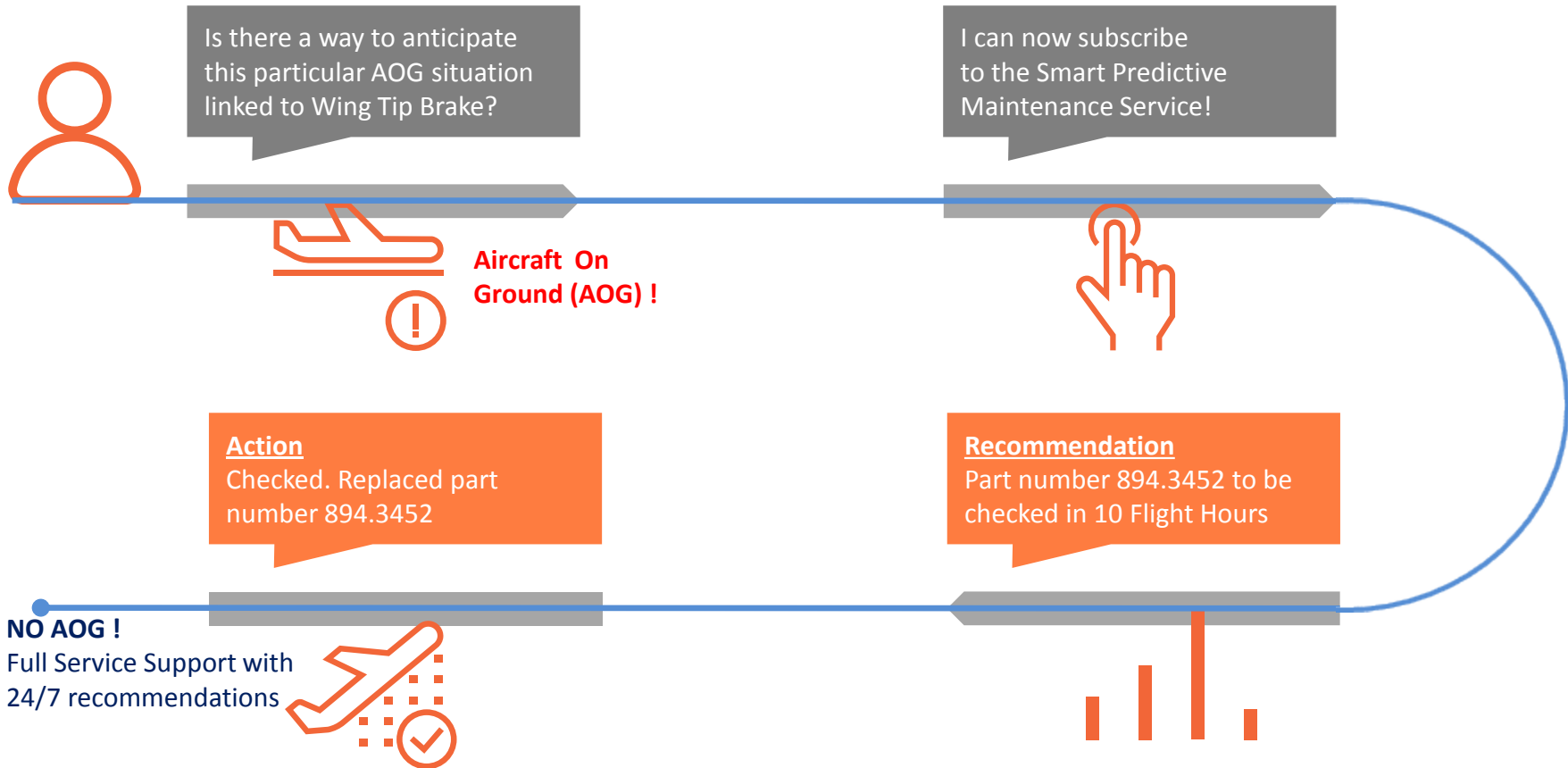


Reducing
maintenance effort

How does it work?

We start from use cases, pain points of our customers and co-develop the solution

Digital Services to solve our customers pain points more efficiently



NO AOG !
Full Service Support with 24/7 recommendations

SmartForce enables allied cooperation

01

A secured digital services suite focused on customer operational readiness

03

All work performed by national staff with the proper level of accreditation

02

A military grade powerful environment that provides computation, capacity and analytics capabilities

04

Increase the scale or decide what is outside the limits of national security

SmartForce Portfolio



DIAGNOSE

Diagnose starts from improving the post-flight report analysis for the optimisation of your workload. Benefit from in-depth analysis to identify automatically the faulted elements to optimise cost efficiency



RELY

Rely offers you solutions to measure the in-service fleet performance by exploring operational data and improve fleet performance insights at part number level



PREDICT

Predict makes unplanned events planned. You minimise short-notice response to unplanned events, such as resource allocation and high priority material ordering



PLAN

Plan optimises the planning and execution of platform related activities and provides, at a glance, a fleet overview with the platform's individual capabilities allowing different set of missions



SUPPLY

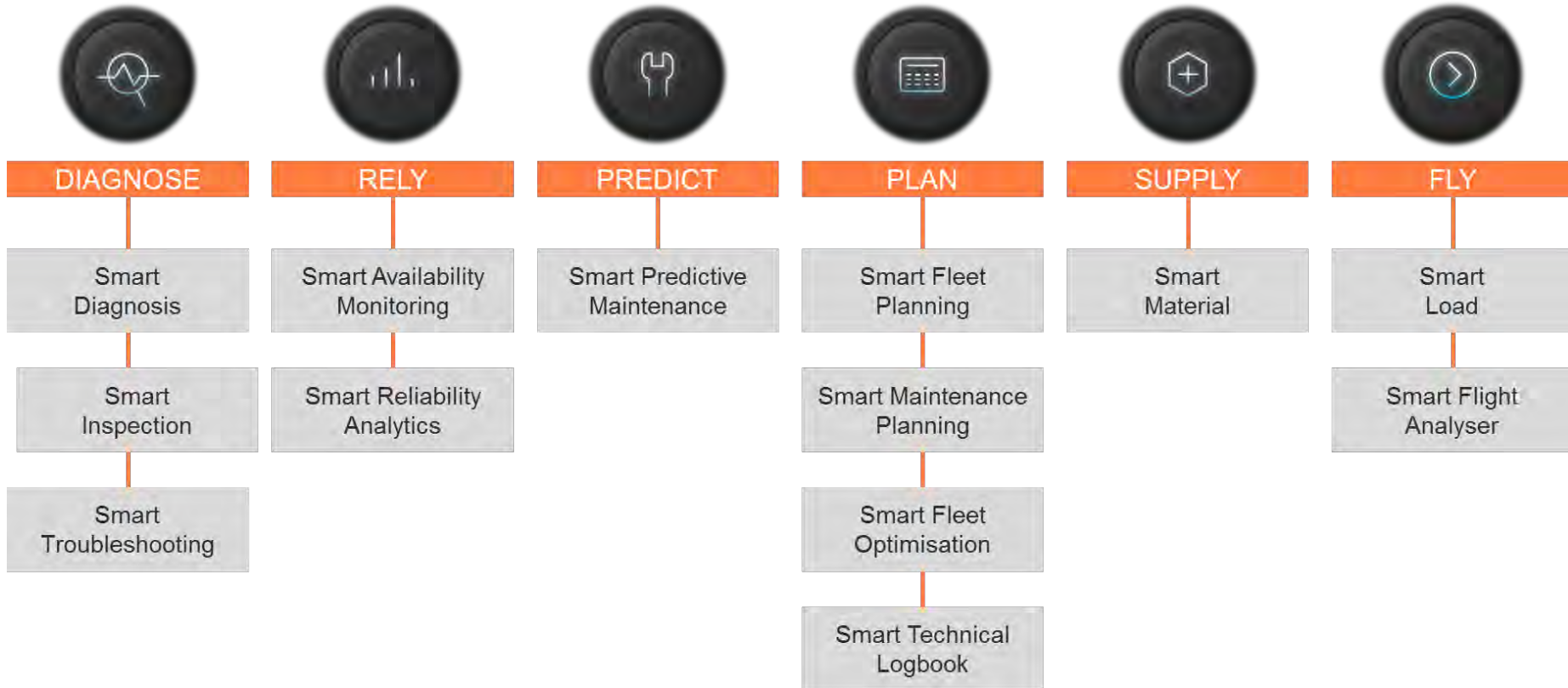
Costs efficiency is becoming increasingly critical for operators. Benefit from in-depth analysis to minimise maintenance and improve parts forecast. Smart Material provides optimised forecast modelling



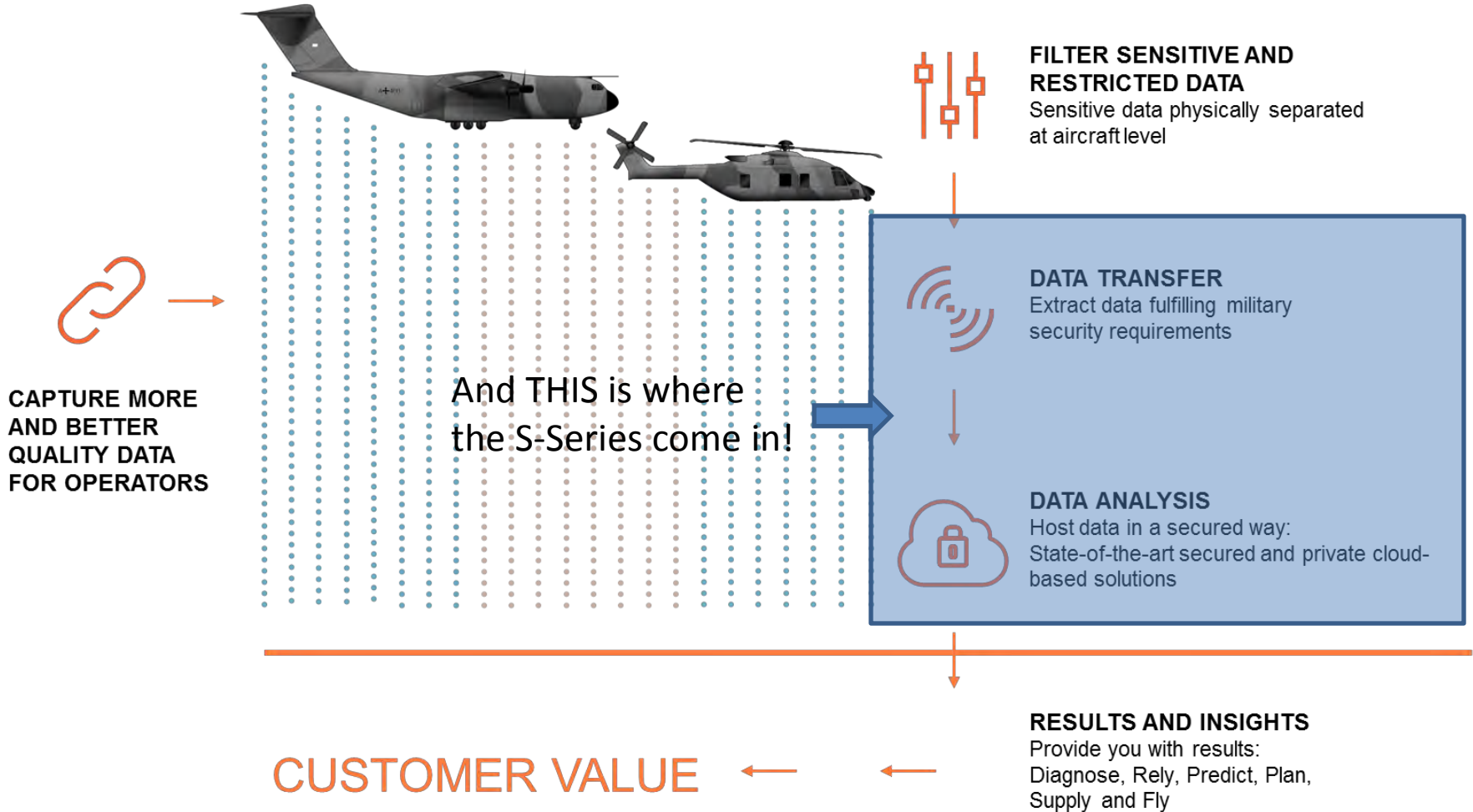
FLY

Fly provides digital services to optimise mission preparation time and improve operational efficiency

SmartForce Portfolio capabilities



How does it work?



So what is the relationship with the S-Series of ILS Specs?

- Customers are fed up (and rightly so) that their suppliers invent new protocols or tools for each new product or service.
- On the other hand, industry cannot cope with multiple heterogeneous maintenance information systems (MIS) used by different customers.
- We should also realize that we cannot have different databases or tools if we want to exploit data massively.
- On the other hand, the S-Series of ILS specifications provide a coherent and interoperable set of data models, including in-service data feedback.
- This coherent data set allows not only to exchange information with customers in one single format, independently of the MIS, but also to integrate it with Engineering information.
- It is for that reason that the SmartForce exchange will be based on S5000F, International specification for in-service data feedback.

So it was easy to do?

- The short answer is NO.
- To benefit from the range of services offered by SmartForce, standardization is instrumental. Harmonization of the services was complex.
- SmartForce was designed together with the customer business areas, who are not necessarily IT specialist. Business objects had to be mapped later to S5000F, so as to be able to perform the exchange.
- Not all data mapped easily (one-to-one) to S5000F, so some adaptation was required.
- S5000F provides a data model, but it is not intended to be used “as is” to develop a database, so some adjustment was necessary.
- Internally we do not have yet all the integration capabilities that the S-Series specifications have. (But we are working on it! 😊)
- Most of the customers do not have a S5000F data exchange in place.

But the good news is...

- By using an international specification, SmartForce is future-proof and will prevent further complication of customer systems – the interface can be used also for other projects!
- Since S5000F is product-independent, SmartForce will use the same data exchange, even if the background calculation algorithms are different for different aircraft.
- Customers and industry can rest assured that their data warehouses contain the same information. We can even help customers to integrate heterogeneous maintenance information systems!
- Given that S5000F allows for easy incremental implementation, customers can “test the waters” with just one SmartForce product and subscribe later to the full suite, deploying it at their own pace.
- And the best of all: SmartForce will continue to grow with more data!

Thank you

for your attention!

Questions?

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Backup slides

- The following slides provide a more detailed overview of the **smartforce** products:
 - **RELY** Smart Reliability Analytics
 - **PLAN** Smart Fleet Planning
 - **PLAN** Smart Maintenance Planning
 - **PLAN** Smart Fleet Optimisation
 - **FLY** Smart Load

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RELY Smart Reliability Analytics

Smart Reliability Analytics is an active monitoring tool for analysing aircraft and helicopters operational data to help increase mission readiness and optimise the fleet sustainment costs.

By capturing data at LRU level, we strive to minimise unscheduled events and therefore increase the mission readiness. To further enhance the analysis algorithms, Airbus offers the ability to anonymously share specific part of the data with your allies. This allows for a larger pool of source data and therefore a better understanding of the behaviour of the LRU and/or systems.

Benchmarking the LRUs against the larger data pool, a future failure can be predicted and therefore a course of action can be recommended. This could be to perform a troubleshooting procedure or to replace an LRU or system. The benefit of knowing the possible failure in advance will avoid ordering high cost material, and work stoppage due to non-availability of manpower. Instead it will anticipate for all key factors enabled by proper planning of material and other resources.

Applicability  

TODAY: On aircraft, only quarterly reports with limited and agreed content available.

TOMORROW: Processing of secured stored data from systems and components which can be accessed remotely.

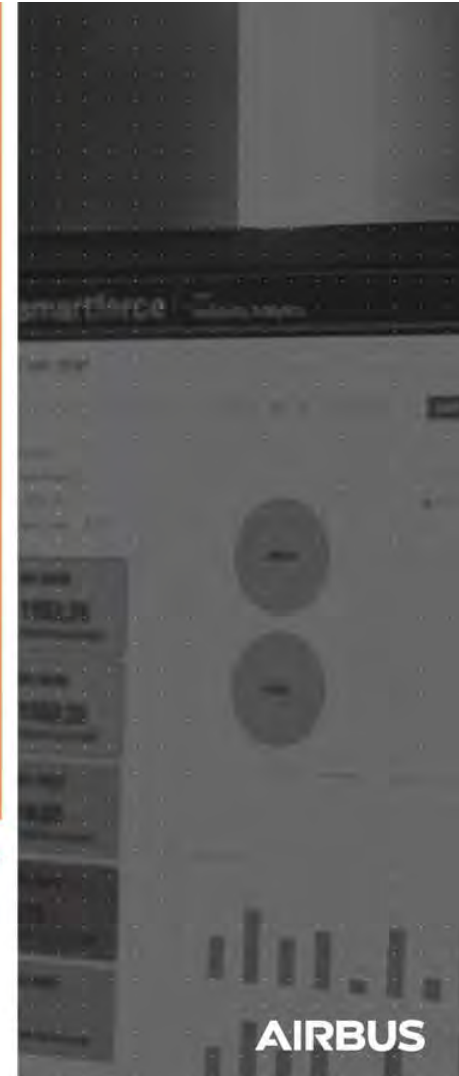
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FEATURES

- Aircraft and/or helicopters systems and components reliability tracking
- User friendly dashboards for easier interpretation of data
- Integration of the performance of any unscheduled maintenance during the scheduled downtime of the aircraft/helicopter

BENEFITS

- Optimise aircraft and/or helicopter readiness for better mission fulfilment
- Reduce aircraft and/or helicopter downtime due to effective maintenance and troubleshooting procedures
- Cost savings due to early anticipation of corrective actions which avoids high cost orders



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PLAN Smart Fleet Planning

Smart Fleet Planning is a flexible, multi platform tool with the ability to reschedule on the go and adapt continually to one's configuration and flight profiles.

Airbus understands that the operators are continuously challenged to plan a variety of missions under increasing complexity that includes constraints such as the scheduled maintenance requirements, the airworthiness compliance and ever changing operational needs.

Smart Fleet Planning facilitates the sound decision making by providing planning scenarios based on the specific configuration of the aircraft and the associated maintenance needs. It provides a summary view of both the available fleet and their respective mission configuration. Smart Fleet Planning helps for rapid and efficient fleet scheduling to cope with all required missions.

Applicability



TODAY: Fleet planning relies on manual scheduling or basic tools.

TOMORROW: All necessary information centralised in one tool. Facilitates decision making by providing planning scenarios.

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FEATURES

- One source for mission planning, maintenance planning and aircraft capabilities
- Based on aircraft, maintenance and airworthiness data input automatically receive warnings prior releasing an aircraft
- High degree of tailoring to meet your military grade language

BENEFITS

- Optimised fleet utilization
- Avoid shortcomings with fleet planning due to unexpected events
- Improved communication amongst your teams



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PLAN Smart Maintenance Planning

Smart Maintenance Planning supports the operator's maintenance organization to plan and execute timely and on cost all the activities required for the continuing airworthiness of the fleet in a demand and dynamic environment of military operations.

With Smart Maintenance Planning, the operators can focus on the optimisation of their maintenance efforts.

As a maintenance task is comprised of accessing, inspecting and correcting deficiencies on an affected area, it is often that certain activities of a specific maintenance task will see repetition. Smart Maintenance Planning enables, through the use of data analytics, to avoid such duplication and therefore reduce aircraft downtime and optimise the maintenance event.

Applicability



TODAY: Maintenance planning relies on manual scheduling or basic tools.

TOMORROW: The service delivers a visualization of the optimised sequence to be followed by the maintenance operators.

FEATURES

- Ability to combine scheduled maintenance tasks to avoid repetition of activities
- Reschedule maintenance tasks based upon findings and availability of resources and material
- User friendly reporting for the ease of decision making

BENEFITS

- Optimisation of aircraft maintenance visits
- Better utilization of hangar slot and resources
- Reduction of time to reschedule maintenance tasks due to unexpected inspection findings



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PLAN Smart Fleet Optimisation

Smart Fleet Optimisation provides strategic decision-making support services to optimise the long term (over five years) maintenance planning of aircraft and helicopters fleets. While maximizing the fleet availability for missions, it leverages the use of human and material resources, the time and the costs.

The Artificial Intelligence engine processes a large set of constraints such as yearly budget, operational mission forecasts, number of planes and helicopters needed, aircraft activities.

The fleet maintenance planner can run several scenarios and tune the optimised planning with his live experience.

Smart Fleet Optimisation offers a friendly, seamless and easy to use interface as well as a set of smart dashboards and reports easily shared within all contributors, from the fleet maintenance users and operational teams to key stakeholders.

Applicability



TODAY: Fleet availabilities planning relies on basic tools or manual scheduling for long term maintenance and mission activities.

TOMORROW: Artificial Intelligence processes large number of constraints and provides Quick & Easy to share optimised planning.

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FEATURES

- Provision of support services for scheduling decision making
- Secured and automated elaboration of fleet planning
- Management of a large set of maintenance and mission planning constraints

BENEFITS

- Increase of fleet availability
- Optimisation of fleet maintenance planning and required resources
- Maintenance cost savings
- Collaborative planning among operator stakeholders
- Consistent fleet planning



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FLY Smart Load

Smart Load provides a 100% digital service for the A400M loadmaster that allows faster load-planning computation and unifies all the information sources used for cargo hold operation.

Smart Load enables safe, efficient and fast cargo load planning for the A400M missions. Vital information for the loadmaster, such as the load & trim sheet, the flight operations manual and the loadmaster reference handbook can be accessed through the use of applications installed in an easy to use rugged tablet.

Smart Load supports a quick and precise response to plan and execute the cargo loading of the aircraft under adverse conditions in the theatre of operations even if cargo and passengers requirements change in the last minute.

Applicability



TODAY: The use of several scattered information sources is required.

TOMORROW: All necessary information is centralised in one table with a laser meter tool integrated.

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FEATURES

- Automated cargo load computations, with error pop up notifications
- Worldwide access to weight and balance data
- Laser dimensioning functionality integrated in the tool to allow fast and precise calculation of cargo loads

BENEFITS

- Optimisation of cargo payloads
- Reduced flight safety risk
- Increased utilization of aircraft and flight crew with reduced turn-around times to load the cargo on-aircraft
- Easy exchange with your allies

