



MAXIMIZING FLEET AVAILABILITY WITH 3DEXPERIENCE NETVIBES

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Challenge:

French aerospace company Dassault Aviation wanted to maximize the availability of its Rafale jets to complete their missions, while optimizing the resources required to operate the fleets across diverse geographies and conditions.

Solution:

In order to create a “step change,” the company uses virtual twin experiences powered by NETVIBES data science on the Dassault Systèmes **3DEXPERIENCE**® platform. Virtual twin experience and big data analytics technologies are game changing for high-performance digital maintenance, repair and overhaul.

Benefits:

Ultimately, the primary benefit is aircraft availability to complete any mission successfully, enabled by:

- The virtual twin experience in context, triggering a higher level of precision for predictive maintenance;
- Knowledge-driven collaboration across the various industrial players, facilitating accelerated diagnostics and capitalization; and
- The ability to leverage any type of data (pilot feedback, sensor data, images and more) elevated into actionable knowledge by all parties, while ensuring security.

A CULTURE OF CONTINUOUS IMPROVEMENT

Dassault Aviation is a French aerospace company with proven expertise as a manufacturer of both business jets and military aircraft. Digital technology is at the core of its innovations, transformation and work organization. The company has been integrating intelligent systems into its aircraft for over 30 years, facilitated by the Dassault Systèmes **3DEXPERIENCE** platform.

In line with its business culture of continuous improvement, in May 2019, Dassault Aviation was awarded a 10-year contract by the French Ministry of Armed Forces to optimize the support services of its Rafale aircraft in order to :

- Boost aircraft availability and reduce maintenance costs
- Ensure data governance
- Provide access to industrial and state partners

“At Dassault Aviation, we believe a virtual twin experience is the only way to achieve this. It requires the most advanced digital model of the aircraft than only aircraft manufacturers have. In fact, a virtual twin experience facilitates modeling not only the equipment, the assets, and the fleet, but also the entire support system as a system to design, simulate and optimize the infrastructure required to operate aircraft under any conditions and at the highest performance,” said Bruno Chevalier, Senior Executive Vice President, Military Customer Support, Dassault Aviation.

PILOTING DIGITAL MRO INNOVATIONS

The conventional aviation industry approach to fleet management optimization services is to analyze accumulated data. When Dassault Aviation wanted to streamline maintenance processes and equipment design, it went a step further with the **3DEXPERIENCE** platform.

When in service, each aircraft behaves differently and requires specific maintenance operations according to the events occurring throughout its operational life. Exponential amounts of complex data are generated from various information systems, whether from industrial partners or aircraft users: flight test, design, operational, manufacturing and open data found in repository databases. And a huge number data points per flight must be analyzed for each aircraft. But the full value of all of this heterogeneous data cannot be realized unless it is available in the context of its usage.

The collaborative **3DEXPERIENCE** platform collects the most valuable Rafale usage data and projects it on a virtual model-based product referential. This virtual twin is an extension of the digital model of the plane, personalized and upgradeable, from design to manufacturing, maintenance and end of life. It's the key to efficient digital maintenance, repair and overhaul (MRO). Consolidating the real-world data combined with those from the digital world allows Dassault Aviation to better manage its MRO contracts by identifying as early as possible the actions required to improve support. Reducing maintenance and forecasting associated resources means more planes in the air.

The company is also progressively enhancing the predictions of diagnostics of the planes, relying on the continuous feedback loop from the data being generated constantly. Maintenance engineers can define predictive maintenance algorithms with artificial intelligence (AI) technologies and machine learning to be able to identify weak signals before breakdowns occur. With predictive maintenance analytics, maintenance engineers can anticipate issues, increase accuracy and devise appropriate maintenance schedules, parts replacements and MRO processes quickly to meet aircraft rate availability objectives.

Data science and collaboration capabilities of the platform ensure that all of the stakeholders are better able to work together and make informed decisions based on data analytics insights. Dassault Aviation applies these insights to its innovations, particularly for predictive maintenance, pilot support, and ground assistance solutions. Order data, manuals, service information, parts availability, regulatory updates, maintenance procedures and more are available the moment they are needed, cutting costs by improving spare part supply chain resilience and reducing inventory.

The ability to monitor contract performance, derive lessons learned, and enrich predictive maintenance algorithms ensures excellence in the operational maintenance processes of the planes.

WHEELS UP

A fully integrated digital platform with a data-driven model is crucial to decrease maintenance costs and optimize turnaround time, fleet availability, flight safety and aircraft sustainment.

The **3DEXPERIENCE** platform connects data, people, products and processes, allowing Dassault Aviation users to:

- Aggregate exponential multi-source heterogeneous data (structured, unstructured, documentation and more)
- Bring together “virtual- and real-world” data based on the virtual twin of an aircraft
- Collaborate with internal and external teams and the supply chain around the globe
- Benefit from innovative technologies (AI, ontologies and taxonomies, graphs and more)

All of this adds up to a significant reduction in the support costs of the planes, quickly responding to customer demands, contributing to mission readiness and gaining a competitive edge.

“Data is at the core of the ability to transform field operations, engineering, quality and manufacturing processes that impact fleet availability. The challenge is no longer about managing billions of events; technology has been mature enough for that for some time, and is also capable of managing heterogeneous data spanning 2D, 3D, images, text or IoT. The challenge is about elevating all of this data into a consistent, normalized model, while creating new ways of collaboration to seamlessly connect the multiple organizations involved in delivering the expected availability.”

Bruno Chevalier, Senior Executive Vice President
Military Customer Support, Dassault Aviation

“Dassault Systèmes is proud to be working with Dassault Aviation to execute the operations and secure predictive maintenance of the Rafale for the French military. With NETVIBES and the 3DEXPERIENCE platform, Dassault Aviation is collecting massive amounts of data generated by the fleet, from each individual aircraft to each piece of equipment and every system contextualized on the virtual twin experience.”

Morgan Zimmermann
CEO of Dassault Systèmes NETVIBES

Focus on Dassault Aviation

With over 10,000 military and civil aircraft (including 2,700 Falcons) delivered in more than 90 countries over the last century, Dassault Aviation has built up expertise recognized worldwide in the design, development, sale and support of all types of aircraft, ranging from the Rafale fighter, to the high-end Falcon family of business jets, military drones and space systems. In 2022, Dassault Aviation reported revenues of €6.9 billion. The company has 12,700 employees.

For more information
www.dassault-aviation.com

Our 3DEXPERIENCE® platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the 3DEXPERIENCE Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating ‘virtual experience twins’ of the real world with our 3DEXPERIENCE platform and applications, our customers push the boundaries of innovation, learning and production.

Dassault Systèmes’ 20,000 employees are bringing value to more than 300,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit www.3ds.com.



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