DATA TAKES FLIGHT:
HOW AVIATAR TRANSFORMS AIRLINE OPERATIONS

A s Dr. Christian Langer explains it, "predictive maintenance" in the airline industry some 40 years ago meant "looking into the engine, kicking the tires and saying, 'This plane can go for another ride.'"

Today, the industry is whizzing past that model — and the vehicle is a cloud-based platform called AVIATAR. Created by Lufthansa Group, it uses real-time analytics to predict, and preempt, just about every operational speed bump airlines experience, from part breakdowns to flight delays.

"This is predictive on steroids," says Langer, vice president of digital strategy at Lufthansa Group and head of fleet solutions for AVIATAR. At the heart of it all lies digital technology that didn't exist just a generation ago. AVIATAR's open platform makes it possible for maintenance, repair and overhaul teams (MROs), as well as original equipment manufacturers (OEMs), to leverage data analytics and cloud computing to take the guesswork out of keeping an airline's assets and operations in top shape.

PLANE BY PLANE:
PREDICTIVE MAINTENANCE IN ACTION

Here's a look at three areas where AVIATAR is leading analytics-driven disruption to bring commercial aviation into a new era.

Launched in April 2017, AVIATAR is a cloud-based operations portal designed to serve not just Lufthansa but any commercial operator. Airlines log onto AVIATAR to check the status of their aircraft fleets, plan maintenance, monitor technology component upgrades and receive automated alerts on wear that may lead to damages.

AVIATAR's predictive analytics streamline operations with two key shifts. First, it unites data from multiple departments (such as fleet management, condition monitoring and reliability management) into a centralized hub; second, it allows airlines to take preemptive action by turning unscheduled events into scheduled events.

Rather than taking a wait-and-see approach, airlines that use AVIATAR can gauge, say, when a turbine is exhibiting decreased efficiency or a navigation system needs a software update well before there's an impact on performance — and the effect on cost is significant. Consider, for example, the integrated drive generator, which is critical to the aircraft's operation. The vast majority of air travelers board a flight without the slightest idea of what an IDG is or what it does, even if they can't see the in-flight movie or turn on the restroom light without it.

Connected to the jet engine, the IDG produces AC current for the plane's electrical system. Since they're cooled by oil, IDGs can easily fail if the oil level gets too low or the temperature too high. And they're one of the biggest-ticket parts on an aircraft — easily costing $500,000 new. Even overhauled versions from retired jets sell in the $200,000 range.

"It's very expensive and critical, and if it fails, you can't repair it but you have to replace it — and it's not something you can do in an hour," Langer says. But there is something airlines *can* do to keep IDGs from quitting because they're among the essential parts that produce in-flight data that AVIATAR can read in real time. It's the data analytics equivalent of having a mechanic riding shotgun with the pilot, monitoring the engine mile after mile.

"This is basically the way we're able to predict future failure before it happens," Langer says. "We can see that IDG failure might happen, and we get an alert that the corrective action is to change the oil."

Thanks to AVIATAR, IDG failures, among other common and costly breakdowns, are becoming a thing of the past. SWISS airlines began using AVIATAR to monitor individual components in March, and Langer says that in about 20% of cases, SWISS has been able to proactively prevent an IDG defect or avoid replacing the device. "Those early warnings prevented [grounded planes] — which for that issue went down to zero," he says. If AVIATAR heads off just 10 IDG breakdowns (equivalent to about 9% of the SWISS fleet), that equals a savings of roughly $5 million.

And predicting damage is one thing, but AVIATAR also goes a step further, using push messages to get the maintenance crew everything it needs before a plane rolls up to its repair station. "We automatically create work orders and determine whether we have the right parts," Langer says. "It combines prediction and fulfillment of maintenance activities. What will it help you if you're told you have to repair something and now you have to get on the phone to find all the parts?"
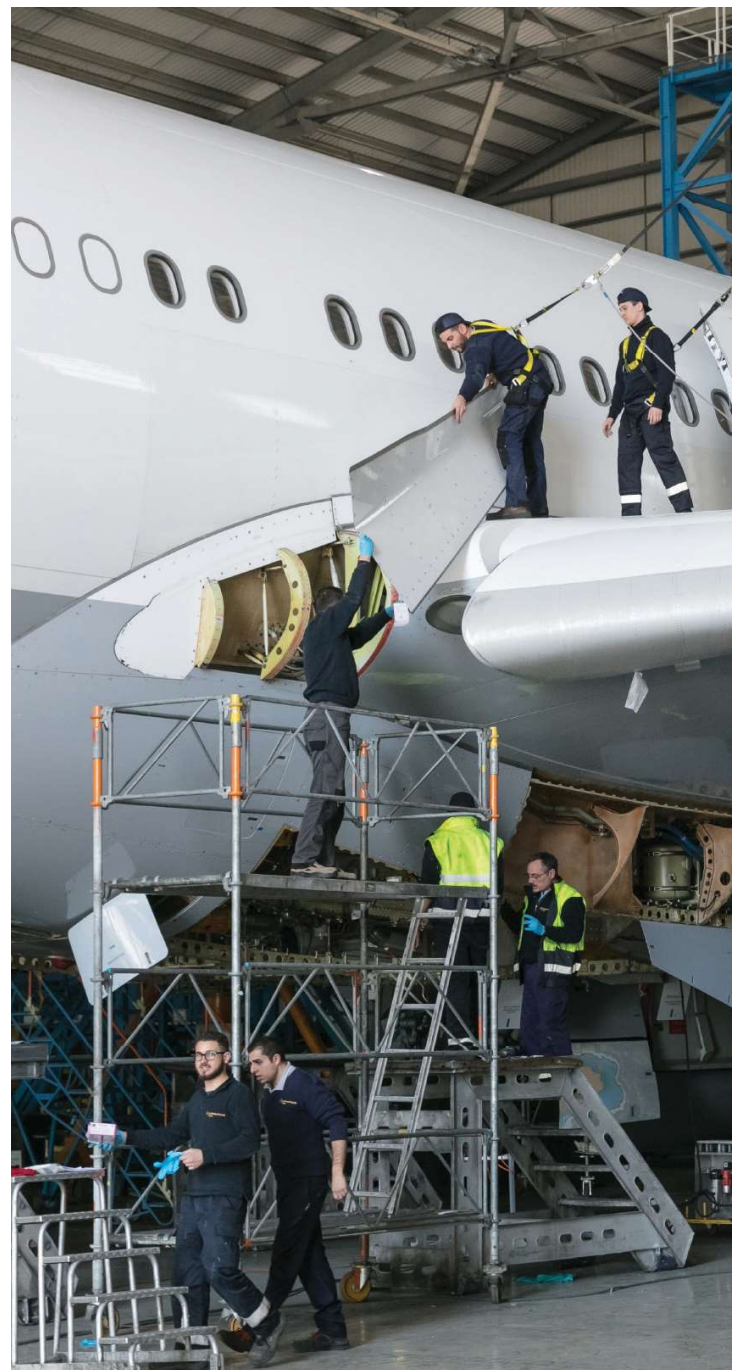
FLEET BY FLEET:
REDUCING GROUNDED AIRCRAFT
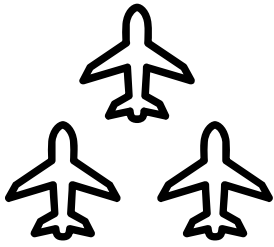
Aircraft on the ground — AOG for short — is a metric airlines use to measure how many planes have maintenance issues serious enough to keep them from flying. And it's not a statistic they like to see in high numbers. When an aircraft breaks or becomes grounded, it can cost airlines up to $150,000 an hour. So SWISS turned to AVIATAR's condition monitoring service to choreograph its entire fleet, with real-time data keeping the optimal number of aircraft in the clouds at any given time. "Whatever data my aircrafts are producing while they fly around the world, my controllers have that on their screen," says Peter Wojahn, chief technical officer of SWISS.

One major challenge centers on addressing parts and maintenance needs for the wide range of aircraft in the SWISS fleet. It flies 89 planes mostly from two major manufacturers. "They all have different software, and so we've had to use different systems to operate our fleet," Wojahn says. "Now, the beauty is that I can control my fleets in one platform."

By centralizing operations in AVIATAR, he says, "there are so many things we can automate and improve. We can ship the part to the airport, doing [repairs] in the shortest possible time; we have all the documentation from the airline manufacturer and the component manufacturer."

For SWISS, it's enough to rethink the AOG acronym as aircraft *off* the ground.

AIRLINE
BY AIRLINE:
ONE SMOOTH
OPERATION

AVIATAR's next goal — already a work in progress and expected to surpass minimum viable product stage within the next 12 months, Langer says — will bring together two distinct airline functions onto one platform. At some companies, technical operations (such as part maintenance) and flight operations (such as scheduling in-flight crews and departure gates) are managed in something akin to silos. Here, the idea is the opposite: to use predictive analytics and automated solutions to choreograph every facet of an airline's day-to-day existence, in one place.

Beyond the metal, tires and wires of jet engines and landing gear, airlines have other moving parts, many of them human, that must run in sync. Imagine a scenario in which an employee in the operations control center of Lufthansa knows an hour beforehand that a plane won't be ready for a 6 a.m. flight from Frankfurt to Hamburg. That means dealing with the passengers and potentially reshuffling crew members who need to be in Hamburg for their next flight.

Through AVIATAR, "you'll have information about which aircraft to fly, which crew members are allowed to fly," Langer says. "An aircraft is nothing if you don't have a crew. You also need to take care of catering, pushback trucks, stairs. You need all these parts to be able to fly, and if you're missing just one, that affects everything."

All told, he says, getting a plane off the ground "is a very complex operation. But now it's something where we can present options that are data driven."

And that helps usher the most important part into place: the passengers — so they can get from place to place. ◼