

AVIATAR – Optimizing airline flight operations with Predictive Health Analytics and building on digital platform technology

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ABSTRACT

AVIATAR uses data from aircraft systems, airline operations, aircraft, maintenance systems and other external sources. Subsequently, it turns that data into actionable insights that empower airline technical operations teams to optimize maintenance and to reduce unscheduled interruptions. AVIATAR includes different modules that can be combined to address different operational needs and requirements.

1. BACKGROUND OF AVIATAR

AVIATAR is a cloud-based platform not just for airlines but also MROs (Maintenance Repair and Overhaul providers), OEMs (Original Equipment Manufacturers) and lessors. The general idea is to accumulate, consolidate and evaluate information in one data repository. By applying analytical models on collected information, instructive interpretations can be derived. Thus, operators can base their decisions and actions on predictive insights, recommendations and notifications.

The platform also promotes its openness to maintenance providers, operators and organizations as defined by the owner of the data. It is not limited to certain providers, but can be connected to other IT (Information Technology) systems and has many interfaces. AVIATAR also benefits from its modularity – in regards to the conceptual design of the platform and to the way of offering it to operators. They can choose from a central connecting hub of applications according to their needs.

With reference to the Air Operations of an airline, the AVIATAR ecosystem (Figure 1) supports and facilitates technical operations (Tech-Ops). The term Tech-Ops comprises all maintenance and engineering, as well as MRO activities and issues an airline has to deal with.

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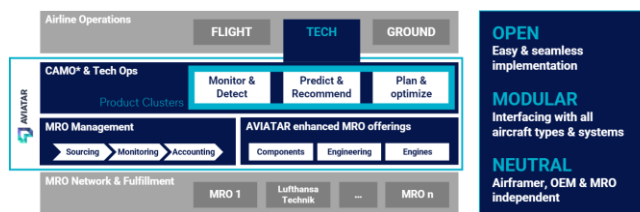


Figure 1: AVIATAR Ecosystem in Airline Operations

2. FUNCTIONS OF AVIATAR

The platform is divided into the different clusters of ‘Monitor and Detect’, ‘Predict and Recommend’ and ‘Plan and Optimize’. Within each cluster, there are different applications (Figure 2) users can interact with, based on their respective needs. In the following subsection, the focus will be on the ‘Predict and Recommend’ and ‘Monitor and Detect’ clusters, where the main modules within each cluster will be explained further.

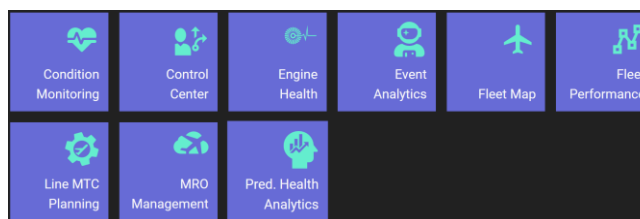


Figure 2: AVIATAR Platform and some applications

2.1. Predictive Maintenance

Within the ‘Predict and Recommend’ cluster, the Predictive Health Analytics (PHA) application is the gateway to Predictive Maintenance. PHA combines engineering experience and data science expertise to build use cases fitting perfectly to airline Tech-Ops needs. With live data from aircraft, systems and components data, it predicts failures during operation. Analyzing different failure modes and combining this information with aircraft data is one of the key features required by engineering teams. Building on decades of operational experience Lufthansa Technik has developed this unique digital platform technology.

These best in class analytics connect airline data for nose to tail solutions across all different aircraft types and ATA (Air Transport Association) chapters displayed on one screen for system engineers and troubleshooters. PHA collects the data your fleet is sending and analyses it with AVIATAR's unique algorithms, which had been developed with industry leading airlines and low-cost operators.

2.2. Airplane Health/Prognostic Monitoring

Monitor the condition of aircraft and all its systems in real time, also during flights – anytime, anywhere. Within the 'Monitor and Detect' cluster, AVIATAR Condition Monitoring (CM) module utilizes the data from different sources to provide airlines with an unrivalled overview of aircrafts' current status and its components – in flight and on the ground – by consolidating all the data in real time. This enables MCCs (Maintenance Control Center) of airlines as well as the troubleshooters and system engineers to proactively manage the condition of large fleets with all aircraft types on one screen.

It allows Tech-Ops teams to improve planning, coordinating and preparing of maintenance tasks and other required activity to maximize the reliable operation of airline fleets. Tech-Ops is immediately notified on the main dashboard, if any of the aircraft experiences a critical incident, which allows Tech-Ops teams to quickly analyze the situation in depth also using other modules available on AVIATAR.

By combining the operational data of airline fleets with the data from maintenance, engineering and information system (i.e. AMOS, Trax, SAP or similar), Tech-Ops can easily trace the action that was taken in the past when a particular fault occurred and immediately react accordingly. All these data is displayed in AVIATAR's unique modular frontend, which is designed for an optimal user experience. CM provides flight schedules and ground time event information for each aircraft - including annotation tool for notes and comments and an automated link to the Troubleshooting Manual and the Fault Isolation Manual.

3. KEY BENEFITS OF AVIATAR

On top of potential cost savings/avoidance, there are plenty of intangible benefits that come with the adoption of

AVIATAR. With the combination of multiple unique modules on AVIATAR, it allows the monitoring of the actual status of airline fleet's performance and keep it in an optimal condition. Hence, the costs of maintenance and operational incidents will be significantly lowered, as well as delays and AOG (aircraft on ground) situations, when aircraft are grounded for technical reasons.

Most important of all, AVIATAR teams are constantly cooperating with airline users, gather feedback and develop applications further to cater to the operational needs of airlines.

4. CONCLUSION

AVIATAR is built upon the strong backbone of LHT's expertise and engineering know-how in the aviation business. Coupled with the best in class analytics developed by the AVIATAR team, the result is a product that has made its name within a market that was previously dominated by the aircraft OEMs.

REFERENCES

Lufthansa Technik AG, "AVIATAR - The Digital Operations Suite," [Online].

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Mia Witzig is Head of Predictive Health Analytics at Lufthansa Technik and responsible for solutions in the Predict & Recommend Cluster of AVIATAR. Developing predictive maintenance applications with her team is Mia's key objective. She finds it fascinating how the different experts in her team, engineers, troubleshooters, data scientists and full-stack developers, all contribute their expertise to the customer's goals and beyond. Mia's 16 years of experience in IT and business development roles at Lufthansa Technik and her educational background in applied computer science at the University of Flensburg enable her to take advantage of newest digital technologies.