PREDICTIVE ANALYTICS FOR THE AIRCRAFT DIGITAL THREAD CONCEPT

Highlights

Industries
- DoD and Aerospace

Benefits
- Improved cost accounting and resource allocation
- Actionable intelligence for data-driven decisions in a fraction of the time previously required
- Predictive analytics to support future asset needs and availability
- Dashboards and visualizations for better data understanding
- Rapid proof of concept to increase usefulness of the data

Technical Areas
- Data aggregation, cleansing, and mapping
- Algorithm development
- Real-time analysis
- Data visualization

Technologies
- Tableau
- SQL
- Python/Spark
- Hortonworks Hadoop
- Tesseract OCR
- Apache Solr

Statistics
- 8 fleets over 8-yr baseline
- 4 databases with 10M+ entries
- 4 levels of drill-down detail in user interface
- 10 availability categories
- Aggregation of 3 databases

Data
- Asset utilization
- Cost reporting
- Source of supply
- Maintenance records

Creating Modern, Customizable Analytic Tools to Assess Aircraft Availability & Logistics Support Needs

Business Challenge

The Air Force required tools for analyzing the digital record of fleet lifecycles—the digital thread—as a means to make real-time data-driven decisions

Providing real-time analysis of data relevant to a diverse set of use cases from which leadership can make data-driven decisions is a challenge. Current data processing pipelines do not account for rapid changes in the landscape of variables that affect aircraft operations or cost, nor do they readily allow flexibility to ask new questions of the data. ILW was tasked to explore, model, and apply advanced analytics to under-utilized data sets. The goal was to increase insight and decrease time to insight into maintenance costs, availability metrics, and logistical support for several fleets.

Innovative Solution

ILW created a digital thread on a big data platform to facilitate automated and customizable fleet health assessments and reporting

ILW aggregated maintenance, supply, cost, and requirements data into an analytical model. The automated pipeline analysis optimizes the process of deriving business value from under-utilized Air Force data and provides root cause drill down to understand asset availability impairments. The solution also completes historical performance time-series analysis, which allows future

performance forecasting and maintenance needs predictions. ILW's big data framework supplies data visualization and enterprise-level actionable information for dissemination to broad audiences. Results provide decision support through the life of a system that is customizable and adaptable to changing situations. This ILW-developed analytic solution can be run in a fraction of the time compared to currently implemented processes.

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