Asset Management at the Replaceable Assembly Level
ALQ-99 Case Study

The Challenge. The ALQ-99 is an airborne electronic attack system used to jam radar and radio frequency signals. The system is mounted on EA-18G military aircraft to provide suppression of enemy air defenses. The ALQ-99 community needed to understand how best to manage asset inventory as systems transition to next generation equipment. At the same time, the transition needed to align with ongoing routine maintenance schedules and other complicated issues.

Our Approach
As Veracity Forecasting Group does in all new projects, we met several times with a cross-section of key stakeholders to hear directly how ALQ-99 assets are used and managed. These meetings provided valuable insight to both Veracity and the ALQ-99 community as we discussed current practices and future needs. Then, as part of our Operations Research process, we acquired a number of data sources from the customer that track assets and their status. Our data scientists wrangled the raw data from various decoupled sources and determined the accurate data fields to use. Data wrangling is an essential element of our process, requiring deep data science expertise (and patience).

Building the Model
With clean and usable data at hand, we then built a simulation model for how the ALQ-99 community manages its assets. We developed probabilistic rate parameters to coincide with various model assumptions and information obtained from the customer. The model projects how ALQ-99 assets flow through the ALQ-99 enterprise, using the current system state as its starting position. To simulate the flow of assets, the model applies readiness requirements, business rules, schedules, engineered rate parameters, and other data acquired from the customer and subject matter experts. From there we are able to create accurate and insightful data visualizations of asset use.

Modeling the Future. The ALQ-99 community now has far greater visibility into current and future inventory management issues. Resource managers can now see which assets will be in short supply due to parts availability and maintenance issues. They also have greater visibility into funding impacts on ALQ-99 maintenance production and ALQ-99 sundown. In addition, managers can explore “what if” courses of action for addressing shortfalls within varying budgeting constraints.

As our work with the ALQ-99 community continues, we are able to build greater fidelity into the model, leading to optimized repair processes and far better understanding of priority-based needs.

Of note. . .
The ALQ-99 program office uses this in-depth forecasting data in support of its Reliability Control Board. The board uses forecasted demand data to assess supply constraints at the replaceable assembly level of the weapon system—one of the first US Navy program offices to do so.
Advancing Analytics Through the Data Lake
To resolve longstanding analytical bottlenecks for the program office, the Veracity team is building a central repository, or data lake, to hold detailed program data generated from multiple sources. The data lake will securely house volumes of once-disparate information about individual E/A-18G aircraft, ALQ-99 pod use, maintenance, and other enterprise data to facilitate advanced analytics. Merely gathering this data is not enough, however. The harder challenge is to effectively exploit and steadily manage the data lake so that it underpins and remains indispensable to daily operations. Veracity is working closely with program office leadership to help ensure the data lake’s optimal, long-term productivity.

Our Operations Research and Software Engineering capabilities are leading replaceable assembly asset management into the future.

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