

Centre for Operations Excellence

Commercial and Defence Data Analysis: A Pilot Study on Performance-Based Logistics

Client Profile

AeroInfo Systems is a division of Boeing Canada Operations whose business offerings include: business and technical advisory services, application development & integration, and targeted business solutions. They serve clients in the security, aerospace, defense, manufacturing, maintenance, transportation and logistics industries.



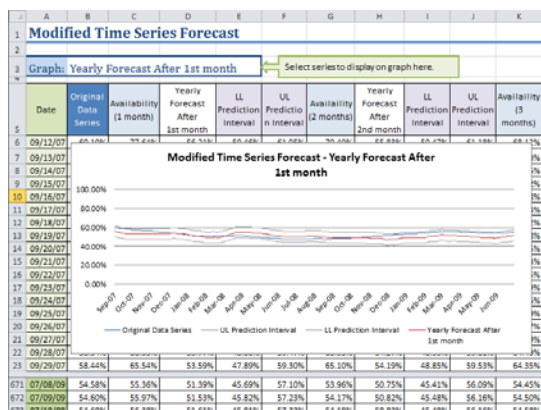
Business Challenge

The capital and risk intensive nature associated with the procurement of a fleet of aircraft has led to the development of a performance-based logistics (PBL) contracting approach as an alternative to that of the traditional time & materials (T & MC). Whereas a T & MC will require the purchaser to pay outright for aircraft equipment and support as needed, a PBL contract structure is characterized by a purchaser being charged according to the supplier's ability to meet certain contractually agreed upon metrics. PBL's popularity has grown since its introduction in to the military over a decade ago and has now become the preferred method of contracting for an increasing number of Armed Forces around the world. As a Boeing Company, AeroInfo Systems has developed PBL business models and has asked the COE for insights into the factors that drive availability for managing PBL contracts.

Value Delivered

The COE undertook a two part project in which Operations Research methods were explored as a means to support AeroInfo's objectives of developing its technical/analytical competencies in the arena of PBL. The results of the first part demonstrate how data mining techniques and regression analysis can be applied to a commercial airline data set in order to anticipate deviations from the Official Airline Guide. The second part of the project focused on pulling PBL type insight from a maintenance database for a fleet of military aircraft currently in service. This was achieved through the calculation of a PBL metric of interest - Operational Availability, followed by the modeling & forecasting of this metric to capture and anticipate the metric's behavior over time.

The COE Approach



Through collaboration with the client, initial efforts were spent gaining a thorough understanding the two data sets provided (Commercial & Defence), cleaning the data and finally transforming the data into a format suitable for subsequent analysis. For the commercial data analysis, pivot tables and regression models (multiple linear and logistic) were developed; for the defence data analysis, a methodology for calculating Operational Availability was devised, followed by the application of three modeling approaches: Time Series, Modified Time Series & Reliability Modeling. The results of the analysis were then presented to the client in such a manner as to showcase how the analytical tools can be employed to support improved operational decision making in a PBL environment.