

Justifications for Tableau

This document outlines the assumptions and justifications underlying the decisions made in designing the dashboarding for the ACME-Flying use case. Tableau was used for creating the dashboard.

The dashboard was designed to visualize four KPIs. The first two KPIs were focused on tracking Flight Hours (FH) and Flight Cycles (FC) per month, filtered by aircraft model, as well as Aircraft Days Out-of-Service Scheduled (ADOSS) and Aircraft Days Out-of-Service Unscheduled (ADOSU) per year, filtered by aircraft within the fleet. To represent these KPIs, a multidimensional data model was created, structured as a cube. The fact concept was materialized as the aircraft utilization view, which was then connected to two dimensions: the Aircraft Dimension and the Months Dimension. Joins were established by linking the attributes AIRCRAFT = ID and MONTHS = ID, where the attributes on the right-hand side corresponded to the aircraftutilization_m_v table and the aircraftdimension or months tables, respectively. The cardinality for both joins was set as one-to-many to reflect the hierarchical relationships within the data.

Subsequently, the two remaining KPIs were computed. These included measures such as Reporting Rate per hour and per cycle (RRh and RRc), Pilot Reporting Rate (PRRh and PRRc), and Maintenance Reporting Rate (MRRh and MRRc) per month, filtered by aircraft model, as well as Maintenance Reporting Rate (MRRh and MRRc) per aircraft model, filtered by the airport of the reporting person. To represent these KPIs, another data model was developed, where the fact concept was the materialized view of logbook reporting. This fact was connected to three dimensions: Aircraft Dimension, Months Dimension, and People Dimension. Joins were established by linking the attributes AIRCRAFT = ID, MONTHS = ID, and PERSON = ID, with the attributes on the right-hand side corresponding to the LOGBOOKREPORTING_m_v table and the aircraftdimension, months, or peopledimension tables, respectively. Similar to the first data model, the cardinality for all joins was set as one-to-many to accurately capture the hierarchical relationships inherent in the data.

Once the data models were created, we developed the dashboard to represent all the KPIs through visual plots.