

Based on the provided airline use case we have decided to build a data warehouse which has two fact tables and four dimension tables, trying to avoid as much as we could the joins and to have good performance when querying the system. The first fact table is named Metrics and it has four dimensions connected to it. This table has the FK of all the dimensions which are Time, Aircraft, Flight Info and MaintenanceReport. Dimension tables:

Time dimension will be used to get the information in different time specifications (day, month, year).

Aircraft contains all the information about the aircraft such as model, registration number, manufacturer and maintenance events. Maintenance events will have the role of the flag with values: scheduled, unscheduled. We will use these flags to get the correct value for each type of maintenance (ADOSS and ADOSU) and we will assume ETL gives us the total hours (we will convert them to days) when the aircraft was ready to use (ADIS).

FlightInfo has all the information regarding the flights starting with the flight number, aircraft registration number (unique for each aircraft), origin and destination (for the airports), status (a flag with values: cancelled, delayed and onTime) and logbook (flag that will include maintenance and pilot logbook). Since the values of pilot and maintenance logbooks are given by ETL, we will just have to perform some aggregate functions to get the results of the KPIs.

MaintenanceReport is created just to make possible the last KPI (part d of the assignment). Since the maintenance person does not belong to the airline, we created a new dimension in order to match the maintenance logbook with the flight destination by matching mr.airportname with fi.destination.

The measures of Metrics are:

- airTime (FH) which will be provided by ETL in minutes and we will convert it into hours when writing the query.
- departures which will be a number 1/0 for each flight and we will count it to get the total number of TO.
- delayDuration for each flight also given in minutes by the ETL process.

Since this fact table is the only one connected to the FlightInfo and MaintenanceReport, we will compute in this fact all the KPIs for the Reports (all part c and d of the assignment). We will count p\_logbook and m\_logbook for their corresponding logbook counts and count these all the entries of these two values to get the logbook count.

The second fact table is ServiceTime and it is connected to the shared dimensions: Time and Aircraft.

The ServiceTime table has two measures:

- usable (ADIS)
- maintenanceDuration will be used to calculate ADOS, ADOSU and ADOSS conditioned by a.maintenance = 'scheduled or unscheduled'.

When deciding which views we would materialize we assumed that the views will be used to provide to get information for shareholders meetings. Those meetings and the data warehousing update will be every three months. This is why we decided to create three materialized views: one for CNR and DYT, one for RRh and RRc and one for ADIS and ADOS. These views will contain the most essential information regarding the airline progress.