DW project 1: Multidimensional Modeling

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1 Assumptions

- All the data for our fact tables comes from AIMS + AMOS + lookup `csv` files. Still, our model can also allow for additional (heterogeneous) data sources.
- The refresh rate of the materialized views need only be on a daily basis.

2 Materialized Views

We consider the user KPI's query speed and ease the top priorities, only after the correctness of the model.

With that mindset, we decided to create four materialized views, that answer the required queries directly, at their appropriate dimension granularity.

KPIs	Name	Dimensions	Facts
(a)	Daily_summary	aircraft, model, day, month, year	FH, TO, DY, TDD, CN
(b) & (c)	Monthly_summary	aircraft, model, month, year	FH, TO, ADOS, ADOSS, ADOSU, ADIS, DY, TDD, CN, logbook count
(d)	Marep_rate_summary	aircraft, model, airport	FH, TO, maintenance logbook count

Table 1: High level Description of our Materialized views

We only populated the materialized views with absolute metrics. The KPI's that represent rates depend on the desired level of aggregation, therefore they need to be computed by the user.

We set a scheduled refresh on a daily basis for all tables, updating `Monthly_summary` and `Marep_rate_summary` two hours after `Daily_summary`, to ensure data integrity.

3 Comments

`Daily_summary` is a data cube with all the metrics from the table **Flights** we are interested in. The other two materialized views perform *roll-up* operations on `Daily_summary`, and a *join* with the **Maintenance** or **Logbook** tables. We decided to include additional metrics on `Daily_summary` to avoid visiting our potentially largest table, **Flights**, more than once.

Our design choice for the materialized views would work very well for a dashboarding application, where the KPIs would need to be consulted at an operational level.