Business rules

Below are listed the business rules that one would expect to be true in the data. Nevertheless, neither the processes nor the DBMS enforced them. Thus, they may have been violated giving rise to quality problems.

AMOS database

Identifiers:

- *workPackageID* is an identifier of *WorkPackage*.
- *workOrderID* is an identifier of *WorkOrders/ForecastedOrders/TechnicalLogBookOrders*.
- *maintenanceID* is an identifier of *MaintenanceEvents/OperationInterruption*.
- *file* is an identifier of *Attachments*.

References:

- *event* of an *Attachement* is a reference to *maintenanceID* of *MaintenanceEvents*.

Datatypes/Domains:

- *subsystem* of *MaintenanceEvents* should be a 4 digits ATA code[1]
- *delayCode* of *OperationInterruption* should be a 2 digits IATA code[2]
- *workPackageID/workOrderID/maintenanceID* should be simply SERIAL numbers generated by an autoincrement[3] mechanism.
- *ReportKind* values *"PIREP" and "MAREP"* refer to *pilot* and *maintenance* personnel as reporters, respectively.
- *MELCathegory* values *A*,*B*,*C*,*D* refer to *3,10,30,120* days of allowed delay in the repairing of the problem in the aircraft, respectively.
- *airport* in *MaintenanceEvents* must have a value.

Other business rules:

- In *OperationInterruption*, *departure* must coincide with the date of the *flightID* (see bellow how it is composed).
- The flight registered in *OperationInterruption*, must exist in the *Flights* of AIMS database, and be marked as "delayed" *(i.e., delayCode* is not null) with the same IATA delay code.
- In *MaintenanceEvents*, the events of kind *Maintenance* that correspond to a *Revision*, are those of the same aircraft whose interval is completely included in that of the Revision. For all of them, the airport must be the same.
    - In *MaintenanceEvents*, the events of kind *Maintenance* cannot partially intersect that of a *Revision* of the same aircraft.
- In *MaintenanceEvents*, maintenance duration must have the expected length according to the kind of maintenance (*Delay* – minutes, *Safety* – undetermined/unlimited, *AircraftOnGround* - hours, *Maintenance* – hours to max 1 day, *Revision* – days to 1 month).

[1] ATA codes for commercial aircrafts: https://en.wikipedia.org/wiki/ATA_100
[2] IATA delay codes: https://en.wikipedia.org/wiki/IATA_delay_codes
[3] https://www.postgresql.org/docs/9.1/datatype-numeric.html#DATATYPE-NUMERIC-TABLE

AIMS database

Identifiers:

- *flightID* is an identifier of *Flights*.

Datatypes/Domains:

- *flightID* is derived by concatenating the following values: *Date-Origin-Destination-FlightNumber-AircraftRegistration* (lengths: 6+1+3+1+3+1+4+1+6=26).
- *delayCode* in *OperationInterruption* is a 2 digits IATA code[2]

Other business rules:

- In a *Slot*, *scheduledArrival* must be posterior to the *scheduledDeparture*.
- Two S*lots* of the same aircraft cannot overlap.
- In *Flights,* departure and arrival airports must be those in the *flightID* (unless this flight has been diverted).
- In a *Flight*, *actualArrival* is posterior to *actualDeparture*.
- In a *Maintenance*, the corresponding events must exist in AMOS inside the corresponding time interval.