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.

Note: The number of the rules are meant to be set in stone, where the number has no particular meaning and it is used to reference to rules in the code.

AMOS database

Identifiers

- **R1**: workPackageID is an identifier of WorkPackage.
- **R2**: workOrderID is an identifier of WorkOrders/ForecastedOrders/TechnicalLogBookOrders.
- **R3**: maintenanceID is an identifier of MaintenanceEvents/OperationInterruption.
- **R4**: file is an identifier of Attachments.

References

- **R5**: event of an Attachement is a reference to maintenanceID of MaintenanceEvents.

Datatypes/Domains

- **R6**: subsystem of MaintenanceEvents should be a 4 digits ATA code. See ATA codes for commercial aircrafts in https://en.wikipedia.org/wiki/ATA_100
- **R7**: delayCode of OperationInterruption should be a 2 digits IATA code. See https://en.wikipedia.org/wiki/IATA_delay_codes
- **R8**: workPackageID/workOrderID/maintenanceID should be simply SERIAL numbers generated by an autoincrement mechanism. See https://www.postgresql.org/docs/9.1/datatype-numeric.html#DATATYPE-NUMERIC-TABLE for details.
- **R9**: ReportKind values “PIREP” and “MAREP” refer to pilot and maintenance personnel as reporters, respectively.
- **R10**: 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.
- **R11**: airport in MaintenanceEvents must have a value.

Other business rules

- **R12**: In OperationInterruption, departure must coincide with the date of the flightID (see bellow how it is composed).
- **R13**: 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.
- **R14**: 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. o In MaintenanceEvents, the events of kind Maintenance cannot partially intersect that of a Revision of the same aircraft.
- **R15**: In MaintenanceEvents, maintenance duration must have the expected length according to the kind of maintenance:
- **R15-A**: Delay – minutes
- **R15-B**: Safety – undetermined/unlimited,
- **R15-C**: AircraftOnGround – hours
- **R15-D**: Maintenance – hours to max 1 day
- **R15-E**: Revision – days to 1 month

AIMS database

Identifiers:

- **R16**: flightID is an identifier of Flights.

Datatypes/Domains:

- **R17**: flightID is derived by concatenating the following values: Date-Origin-Destination-FlightNumber-AircraftRegistration (lengths: 6+1+3+1+3+1+4+1+6=26).
- **R18**: delayCode in OperationInterruption is a 2 digits IATA code 2

Other business rules:

- **R19**: In a Slot, scheduledArrival must be posterior to the scheduledDeparture.
- **R20**: Two Slots of the same aircraft cannot overlap.

- **R21**: In Flights, departure and arrival airports must be those in the flightID (unless this flight has been diverted).
- **R22**: In a Flight, actualArrival is posterior to actualDeparture.
- **R23**: In a Maintenance, the corresponding events must exist in AMOS inside the corresponding time interval.