Model2ADF Framework – a complete Model Driven Spacecraft Reference Database (SRDB) Application automatic generation

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The TEC-SW Database Reference Facility is a key toolset used by TEC-SW in its support to the ESA Missions (involving currently e.g. Galileo, SmallGeo, EarthCare, Sentinels, EDRS). ESTEC/TEC-SW is involved in:

- the Space Segment development (providing support to the Primes in their task to develop SRDB systems and to verify/validate SRDB data)
- the Space Segment to Ground Segment and Operations interface, providing support to ESA projects in verifying that data delivered by the Space Segment complies with the Ground Segment and Operations requirements.

The **Space System Information Base** (SIB) is a component of the TEC-SW Database Reference Facility and it is used to verify the quality of the SRDB exchanged between the Space Segment and the Ground Segment for operations.
The SRDB of a given project complies with the project-specific SRDB data exchange ICD i.e. the formal ICD that is used in order to deliver the SRDB dataset from the Space Segment Prime to the Ground Segment.
The project-specific SRDB data exchange ICD is currently used as the underlying project-specific database physical model of the SIB application software.

Driven by the underlying project-specific database physical model, the SIB application software enables the capability to automate:

1. the generation and instantiation of the project-specific Oracle database physical schema in compliance with the project-specific ICD
2. the generation of the project-specific import facility to allow loading, within the Oracle database, any dataset provided through the Project data deliveries (compliant with the project-specific ICD)
3. the generation of the project-specific consistency checker (compliant with the project-specific ICD)
4. the generation of the project-specific export facility to allow extracting, from the Oracle database, any dataset (in compliance with the project-specific ICD)
5. the identification of the impacts that any data change has on the validation of the existing configuration items
6. the identification of the differences between the configuration items of two different versions of a dataset.

However, the project-specific man machine interfaces provided by the SIB has been, up to now, manually implemented.

The required SIB man machine interfaces are of 2 types:

1. "tabular": the MMI is structured according to the database physical model
2. "configuration item": the MMI is structured according to the stakeholder view of the data.

The man machine interfaces currently available in the SIB software is of "tabular" type and limited to the ESA/SCOS system MCS needs.

In order to fill the gap concerning the SIB MMI limitation, the **Model2ADF Framework** has been developed, finally realising the possibility of having a complete Model Driven Spacecraft Reference Database Application automatic generation framework, including the automatic generation of both the SIB "tabular" and "configuration item" MMI based on the SIB database physical model as well as on the SIB MMI model.

Thanks to the use of the Model2ADF Framework, complete SRDB applications can be rapidly generated and deployed based on the input SRDB database physical model and MMI model.