EGS-CC CDM Engineering Support

Abstract

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The « EGS-CC CDM Engineering Support » activity was implemented by CS GROUP - ROMANIA SA as a GSTP contract, in the frame of the European Ground Systems – Common Core (EGS-CC) programme.

The data modelling in the EGS-CC is conceptualized by the Conceptual Data Model (CDM), which defines the semantics of the data definitions without specifying the physical data format of the data. To enable the application of model-driven software engineering, CDM is described in a formal language. The baseline for the data model specification is Unified Modelling Language (UML). The CDM is defined as an extended Eclipse Modelling Framework (EMF) Ecore model.

The main actions that were done as part of this project were:

- Providing support to CDM Working Group for the improvement of CDM documentation and the creation of Confluence web pages into EGS-CC Knowledge Base site, about various CDM artefacts (i.e. Activity Argument Types, Activity Pre- and Post-conditions, Calibrations and De-calibrations, Checks and Conditions, PUS Services),
- Elicitation of consistency rules from CDM Technical Note, as well as from other EGS-CC documents and ECSS standards,
- Creation of CSDE Jira pages for each defined consistency rule and following of an approval, investigation and implementation workflow, with contributions from ESA team members and other stakeholders,
- Implementation of a set of 155 consistency rules compatible with CDM 1.14.2 version using Apache Groovy language,
- Creating sample CDM datasets using OPEN-M tool, as well as test scripts for the validation of the implemented consistency rules,
- Creation of a project for the validation of CDM datasets by executing all the implemented consistency rules without the use of OPEN-M tool. The application (Tscl-light) allows the execution of each consistency rule on all the CDM dataset files as an Eclipse project or as a command line tool using Maven.

CS GROUP - ROMANIA's team gained a solid knowledge of the Conceptual Data Model (CDM) that is used by EGS-CC programme, its documents and artefacts, the requirements from which they were defined and the tools to model them (OPEN-M, DME). We can act as a reference for the EGS-CC Knowledge regarding CDM.

This activity and its results will have strategic implications in the space roadmap of Romania and will allow CS GROUP - ROMANIA to participate to other EGS-CC related projects (i.e. EGS-CC Phase E, evolutions of OPEN Preparation Environment, etc.).