Development of a Test Report Standard

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ABSTRACT

The objective of the study was to define a proposal for a future test report standard for the European space
industry that shall be included in the ECSS-E-ST-10-02C (Space Engineering – Verification). The study was divided
into four tasks:

- Task 1: Survey of current state (comparison of test report formats and tools)
- Task 2: Requirements analysis
- Task 3: Interface definition and creation of data model
- Task 4: Test report standard definition (change proposal for the ECSS)

The initial task was to perform an analysis of existing test reports created within the scope of different projects and
business units across the three companies participating in the study. Each company has involved several teams from
different departments in order to obtain a representative overview of the current situation.

The analysis of the different test reports has revealed good and bad practices concerning the preparation of test reports,
as well as the necessity to improve the compliance with the ECSS-E-ST-10-02C standard. A harmonisation of test
reports (i.e., a test report standard) and an automation of the test report preparation have been identified as the main
improvements to be realised.

Based on the results of the test report survey, the goal of the second task of the study was to define a set of requirements
for an automated test report generation tool, written in the form of dedicated "user stories". The main addressed subjects
are:

- the collection and storage of the test artifacts generated/created before, during, and after test execution,
- the data processing that can be performed on/using the artifacts during and after test execution,
- the test report generation and customisation,
- the integration with external tools like an anomaly manager, a document workflow manager, etc.

The user stories resulting from task 2 were used as the basis for developing a semantic data model for describing the
internal structure of a test generation tool in order to assemble and process all information that is required for generating
test reports in a standardised way. The data model was developed using the Ontology Web Language (OWL) format
and documented by creating a corresponding set of UML diagrams for illustrational purposes.

The following functional units are described in detail by the model:

- Resources
- Test activities
- Acceptance criteria for test activities
- Requirements
- System model
- System Operations Baseline (SOB)
- Test artifacts
- Test report

To conclude on the results of the three previous tasks of the test report study, a change proposal for the ECSS document
ECSS-E-ST-10-02C was written. All results of the previous tasks were analysed and compared in order to obtain a list
of changes to be applied to the current ECSS, mainly by adding new elements to the definition of a test report and
providing some good practices to produce the documents (e.g. automated generation of the test reports, digital
document format, etc.).

The entire study was an opportunity to understand the difficulty to obtain comprehensive information on a subject in a
huge company like TAS, ADS, or OHB. Each team had its own understanding of the term "test report". As a result, the
test reports provided by the different teams differ significantly in terms of document structure and content. To avoid

these differences and to provide a definition of a standard for test reports, the participants of the study propose to enhance ECSS-E-ST-70-31C. The data model that has been defined within the scope of task 3 of this study is intended to provide a basis for developing an appropriate system that supports an automated processing of test artifacts and generation of test reports.