Model Based Standardization of a procedural language: Conceptualization of the ECSS-E-70-32.



VITROCISET

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ECSS-E-70-32 Summary

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ECSS-E-70-32 Status

- Ambiguity problems
- Use of relative referencing
- Grammar based implementations PLUTO
- Increasing demand for extensions to the standard
 - New standard functions
 - Use of global variables
 - Allow several parallel watchdog instances for the event

Goals of the conceptualization

- Provide an standardized and verified data model for procedures without implementation constraints.
- Provide an ICD for procedures.
- Allow extensions to the standard to be done in a qualified and verified model.

 Discover and remove inconsistencies and ambiguities of the standard.

Compliance → SEMANTIC ✓ GRAMMAR ×



Layers of conceptualization

Data

Model the information and structures contained in the standard.

Conceptualization Approach Data formalization



Layers of conceptualization

o Data

Model the information and structures contained in the standard.

o **Grammar**

Define the syntax of the procedures according to the formal data.

Grammar formalization





Layers of conceptualization

o Data

Model the information and structures contained in the standard.

o **Grammar**

Define the syntax of the procedures according to the formal data.

• Business

Model the data flow and behavior of the procedures.

Business formalization

- Specification in a formal way
 - Data flows between processes.
 - Collaboration between information repositories
 User interactions with the information system



Use of the standard BPM to model processes.

ASE-5 Project

- Goals:
 - FORMAL METHODS
 - VALIDATION & VERIFICATION
 - COMPLIANT WITH ECSS-E-ST-70-32
 - QUALITY SYSTEM FOR ACTIVITY PREPARATION/EXECUTION ENVIRONMENT
 - SCALABILITY TO OTHER MARKETS
- Require
 - CREATE PROCEDURES CONCEPTUAL MODEL
 USE SSM CONCEPTUAL MODEL

Steps for the conceptualization:
 Model the semantics of the standard.
 NOT only static data → also dynamic.

- Discover common concepts between parties and harmonize definitions.
- Validate the completeness and correctness with stakeholders.

Integration between parties



Integration between parties



On-going working case Application in the ASE-5 project







On-going working case Application in the ASE-5 project



• Application in the ASE-5 project



Conclusions

 Output of the process Conceptual models Static and dynamic data in ORM Business process in BPM Logical models XML Schema of the standard acting as ICD. E/R models Grammars for writing procedures. Physical models SQL scripts/JAVA classes BPEL processes Compiler of the grammars









Vitrociset Belgium Rue Devant les Hêtres 2 B-6890 Transinne. Belgium Tel: +32(0)61 230 001 Fax: +32(0)61 230 269



Thank you for your attention











 Vitrociset Germany
 V

 Lise Meitner strasse, 10
 's

 64293 Darmstadt - Germany
 2

 Tel.: +49 (0)6151 95734-12
 T

 Fax: +49 (0)6151 95734-26
 F

<u>Vitrociset Netherlands</u> 's Gravendijckseweg 53 2201 CZ Noordwijk - The Netherland Tel.: +31 (0)71 3649770 Fax: +31 (0)71 3648960

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