ESA Architecture Framework Upgrade
Final Presentation

Dr. Todor Stoitsev, 13.12.2017

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a LEONARDO and THALES company
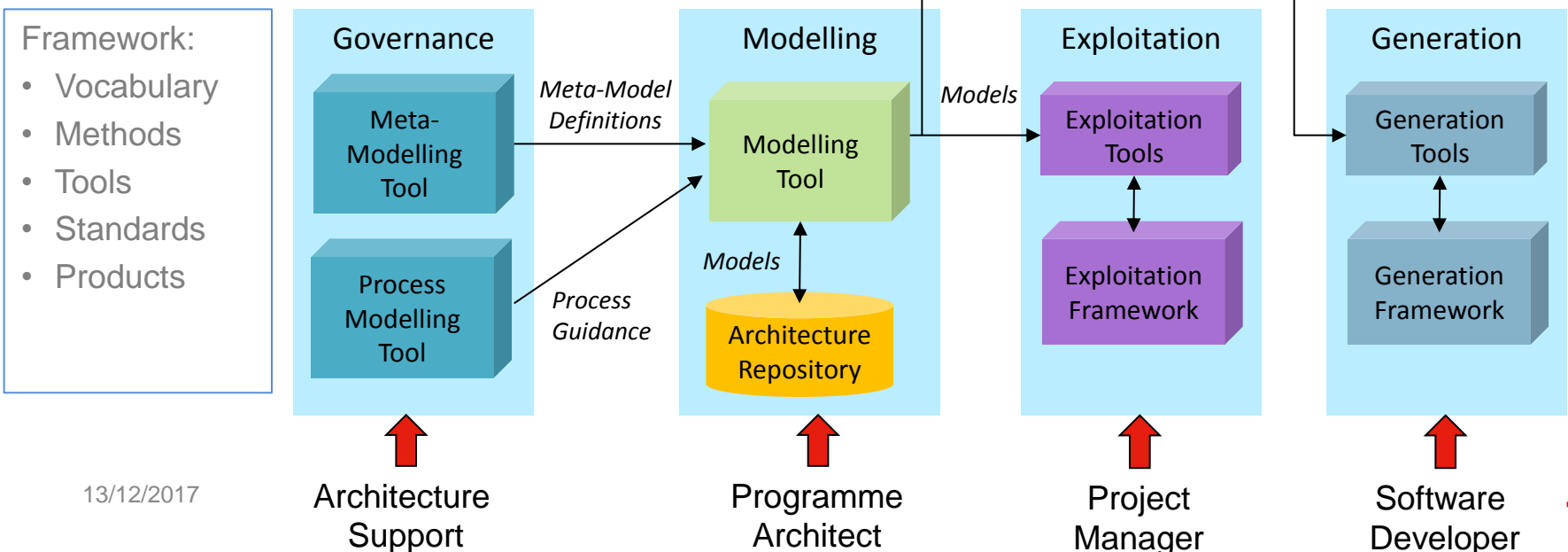
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1. Background and Objectives

Background

- **ESA Architecture Framework (ESA-AF)** - Enterprise Architecture Framework supporting systems and System of Systems (SoS) architecture development covering strategic, operational, procurement, programmatic, and technical concerns

- **Architecture Framework** - comprises *vocabulary* (meta-model), *methods*, and *tools* for developing architecture *products* (building blocks) compliant with a set of recommended *standards*

- **ESA-AF Vocabulary/Meta-Model** based on OMG UPDM, SysML, SoaML, all having UML as basis

➜ *good knowledge of UML required for modelling*

- **ESA-AF Tooling** MagicDraw for modelling and meta-modelling based on UML and Eclipse for model exploitation

➜ *third-party tooling needs to be kept up-to-date*

1. Background and Objectives

ESA-AF Overview

- Model-driven approach supporting framework evolution (tooling generation from meta-model)
- Meta-model based on established industry standards (UPDM, SysML, SoaML, UML)
- Process based on TOGAF Architecture Development Method (ADM)
- Enhanced modelling support
- Powerful exploitation framework with ad-hoc diagramming and reporting
- Support for model-based software engineering of web services through XSD and WSDL platform mappings and artefact generation

Framework:
- Vocabulary
- Methods
- Tools
- Standards
- Products

Governance	Modelling	Exploitation	Generation
Meta-Modelling Tool	Modelling Tool	Exploitation Tools	Generation Tools
Process Modelling Tool	Architecture Repository	Exploitation Framework	Generation Framework

Meta-Model Definitions

Process Guidance

Models

Models

Architecture Support

Programme Architect

Project Manager

Software Developer

1. Background and Objectives

Objectives

- **Develop Form-Based Modelling Environment** allowing users without UML modelling skills to create models

- **Elaborate space based SoS Component Libraries** providing components that can be reused in ESA-AF architectures

- **Upgrade the user guidelines** and provide **video tutorials**

- **Provide 1 year maintenance**

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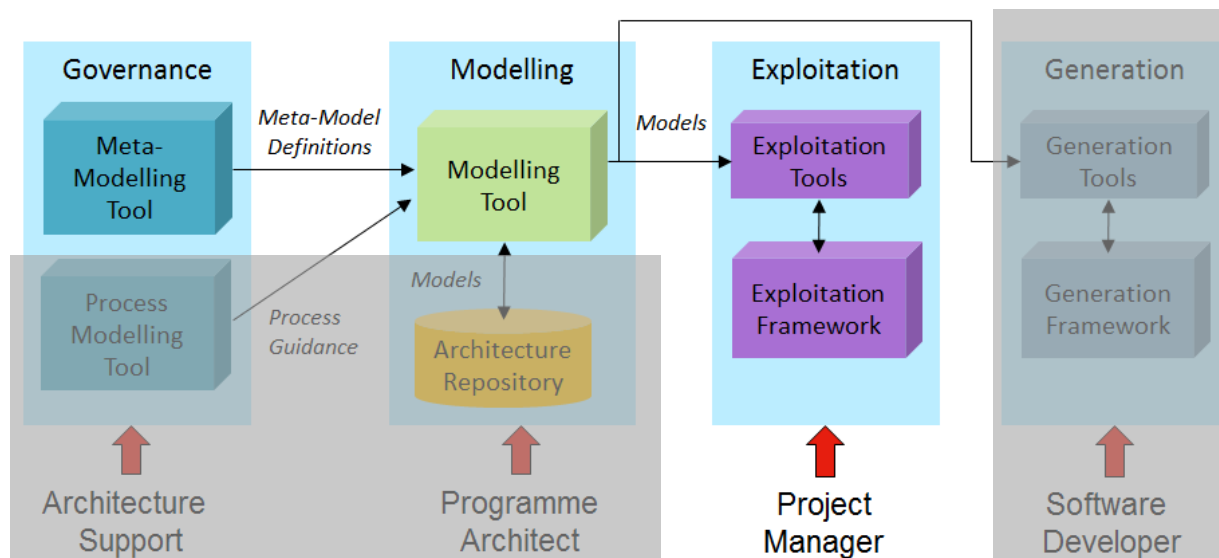
2. Form-Based Modelling Environment

Process Overview:

- ❉ Overview with standard model development scenarios (customizable) including high-level steps covering major viewpoints

- ❉ Integrated documentation for viewpoints and individual elements generated from meta-model

- ❉ Sub-viewpoints integrated in viewpoints section with their associated elements

- ❉ Process documentation and glossary can be displayed over standard web-browser view

2. Form-Based Modelling Environment

Data Entry:

- Standard input forms (customizable) generated from the meta-model, covering structural aspects

- Integrated documentation generated from meta-model

- UML constructs created in the background transparently

- Diagram representations can be provided by using the standard MagicDraw diagramming capabilities

2. Form-Based Modelling Environment

DEMO

3. SoS Component Libraries

- **SoS Components Library** providing generic, common constructs that can be used in any space-related SoS architecture

- **ESA-AF EO SoS Components Library** providing constructs that specifically relate to Earth Observation (EO) SoS architectures

- ESA-AF EO SoS Components Library builds upon SoS Components Library

- Libraries cover high-level aspects as architectures tend to be specific for the concrete mission/project

- Recommended reuse approach is through copy and adaptation because inheritance would create strong dependencies in the UML models, could limit reuse and hamper maintenance
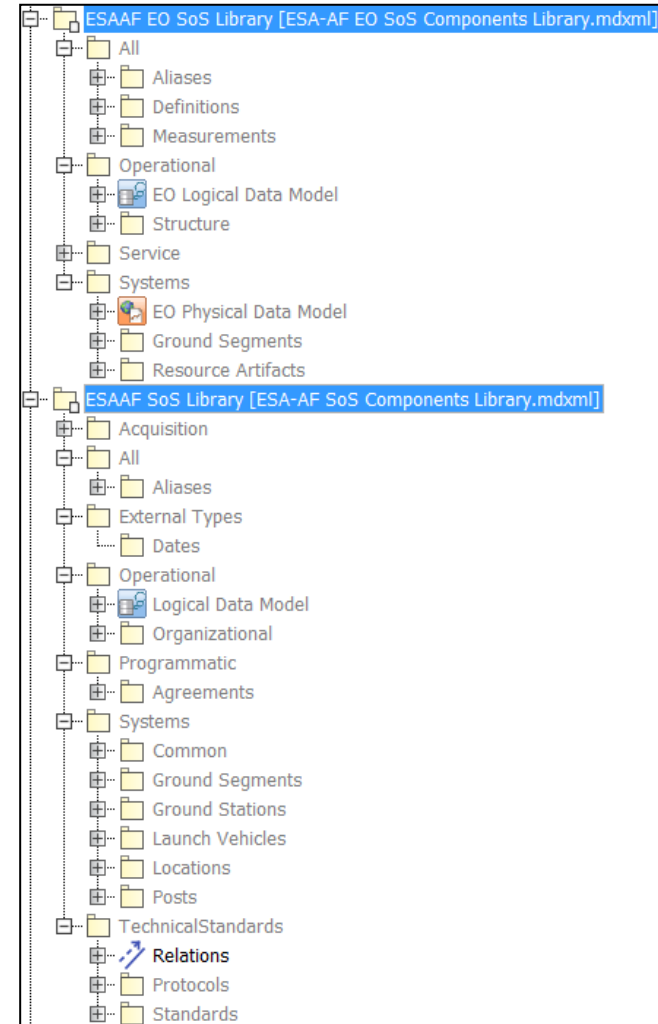
4. User Guides

- Dedicated installation guide created

- Renamed modelling and meta-modelling guideline documents to Software User Manual (SUM) of the modelling and meta-modelling tools

- Enhanced SUM for the modelling tool with additional aspects covering the form-based modelling environment and the SoS Component Libraries

- Created video tutorials:
    - Introduction of ESA-AF Data Entry Framework Environment
    - End-to-end modelling scenario using ESA-AF Data Entry Framework
    - Reusing the ESA-AF SoS Component Libraries

5. Summary and Next Steps

- 1 year maintenance period running until 15th June 2018

- Final software upgrade to latest versions of MagicDraw and Eclipse foreseen in 2018 before end of maintenance

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*Telespazio VEGA Deutschland GmbH,
Europaplatz 5
64293 Darmstadt,
Germany
www.telespazio-vega.de*

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