Rendicontazione MiniGrant RNS5

Study of MBSE methodology to identify and create useful templates and proper tools for the management of projects for astronomical instrumentation

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Completed activities

- Advancements in the definition of the MBSE methodology for astronomical instruments using some ESO projects in INAF as test cases
- Successful fields of application of MBSE in the management of
  - **PBS and BoM** – application to CUBES for VLT, to MORFEO and ANDES for ELT
  - **System interfaces** – applied to ANDES
  - **Connectors and cables** – applied to MORFEO
  - **Operative scenario** – applied to CUBES for calibration and observations, to MORFEO for startup procedures. This modeling leads to **easy computation of operative times and power demands**
  - **Requirements and their derivation process** → applied to MORFEO, ANDES, and CUBES

4 papers submitted to SPIE 2024
2 papers submitted to INCOSE 2024

Future Developments

- Focus on effective methodologies to interface and interact with different tools → possibly evaluate commercial software that can provide needed interface capabilities among various tools and Cameo (e.g. Syndeia)
- Explore tools to help non-MBSE users interact with the system model according to their needs and contributions (e.g. Cameo System Modeller)

Budget Management

- Overall budget = 20k€

Total Expenses → 6600€

1. Personal Computer → 3800€
2. MODELS 2023 Conference → 2800€

Future Expenses

1. INCOSE 2024 conference → ≈ 3000€
2. Syndeia license (part of) → ≈ 4500€
3. Cameo Collaborator License → ?€
4. Formative events → ?€

Future Developments

- Improvement of PBS and BoM management strategies
- Inclusion of test procedures and outcomes into requirements' properties
- Further definition of the AstroMBSE profile to better catch the peculiar features of astronomical instruments in SysML elements
- Focus on effective methodologies to interface and interact with different tools → possibly evaluate commercial software that can provide needed interface capabilities among various tools and Cameo (e.g. Syndeia)
- Further elaborate the requirements refinement process to make it more automatic and related to SysML control logic
- Explore tools to help non-MBSE users interact with the system model according to their needs and contributions (e.g. Cameo System Modeller)