

MARVL - Model-based requirements-verification lifecycle

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Model-Based System Engineering (MBSE) is increasingly being adopted in industry in favor of a document-centric approach. This improves efficiency, provides more transparency in design choices and improves the communication of engineering information between the different stakeholders.

Many (MBSE) tools are being used by industry to create a wide variety of digital models, but the exchange of information between the customer and supplier is often still very much document centric. At almost every stage there is a conversion from models to documents and vice-versa rather than a model exchange. This is time consuming, costly and can lead to loss of information and loss of traceability. This has the following down-sides:

- The same information is repeated in different documents,
- Inconsistencies of information due to lack of configuration control,
- Documents are generated from tools or databases and are isolated from these source tools or databases
- There is an inherent difficulty in navigating between the supplied documentation
- Accessibility and visibility of relevant information to all parties involved
- Tracking of evolution, changes, agreements with impact on system definition and status is difficult to achieve

The Model based Requirements Verification Lifecycle (MARVL) project aims to address these problems by developing a methodology and supporting infrastructure to improve the processes and the related information exchange. The MARVL project is part of the Technology Research Program of ESA, which is executed by an industrial consortium comprised of RHEA, ScopeSet and Airbus.

The Common Information Platform (CIP) is developed during the MARVL project. It is an IT solution that supports the exchange of requirements, design and verification information between the different actors, each of whom might use different tools and might be in a variety of forms such as models and analysis reports. The main challenge is to define tools that can continuously support the evolution of information throughout the project life-cycle, while still allowing specialist tools to be used during specific phases. The CIP needs to be able to accommodate and manage many forms of information as well as MBSE based information. PLM and PDM systems are being used. These are very powerful but treat all the managed artifacts as black-boxes without visibility on their internal contents. There is a need for a smart but light-weight information management system that overcomes this limitation and provides end-to-end data connectivity between the content of the artifacts. The vision of the consortium is that the CIP can provide the basis for this.