Model-Based System Engineering (MBSE) Services

Your collaborative MBSE partner for complex engineering projects

STARION

Enhance your engineering projects by using models instead of documents, from the conceptual design phase all the way through a system's life cycle. Model-based system engineering (MBSE) increases efficiency and productivity, produces better results and provides an 'authoritative point of truth' for your data.

Low-cost entry to MBSE

Starion Group is an early adopter of MBSE. Our experts have extensive experience in helping organisations to adopt MBSE and transform their system engineering practices to be more multidisciplinary, data driven and traceable without drastically changing their design approach.

Starion can support your engineers with training, hands-on modelling support and process facilitation to enable them to gradually adopt MBSE and learn on the job. In this way, your organisation can profit from MBSE without disrupting its operations.

Starion provides many open source building blocks to build and support the MBSE ecosystem, ranging from requirements engineering based on ReqIF and SysML v2 software libraries to full standards-based MBSE applications.

- **MBSE services and training** – CDP4-COMET, Capella™, Systems Modeling Language (SysML)™ v1 and v2, Requirements Interchange Format™ (ReqIF)
- **Software components and tool customisations** – ECoreNetto, ReqIFSharp, SysML2.NET, DEH-Capella, DEH-EA, DEH-CSM
- **Our own open source collaborative MBSE application** – CDP4-COMET.

CDP4COMET®

Enabling fact-based decision-making

Starion's experts offer design, modelling support and training in a broad range of MBSE languages and tools. We apply MBSE methodologies using the following key principles:

- **Lean modelling** – Your models should support your decisions: therefore model only what you need, don't model the whole world.
- **Consistency** – From the start, we think before we model. A good architecture and the use of effective design principles helps the team to model aspects only once.
- **Collaborative and multidisciplinary** – Design challenges often reside in the interfaces between domains. We involve all key domain experts from the start and ensure ownership and commitment as early as possible.
- **Digital continuity** – We aim to support each programme's complete life cycle and help you ensure models can continue to be used in future phases.
- **From model to documentation** – Automatically generate documentation from your model and make the transition from a document-based approach to a model-based approach.

Next generation design: MBSE benefits

MBSE enables your organisation to capture a design more rigorously, investigate options and compare alternatives, risks and trade-offs in a continuous fashion. This helps you to explore feasibility and accommodate changes with less effort, gaining greater insight into the effects on behaviour, performance, cost and planning.

MBSE enables your organisation to:

Ensure consistency

Storing and managing all design data in one place ensures all engineers use the most recent and accurate data at every stage.

Calculate performance earlier

For example you can create size, weight and power (SWAP) budgets, mass balances and cost overviews earlier in the design.

Explore options quickly

An MBSE model enables alternatives to be explored faster.

Manage changes and increase traceability

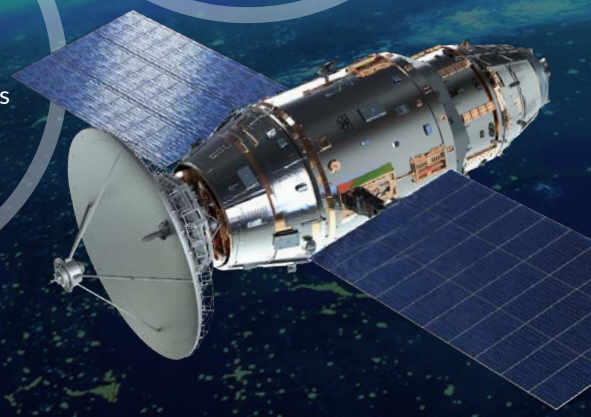
Keep track of changes and how they impact the design.

Automated verification

Link the design parameters with the requirements to automate verification.

Reuse designs efficiently

Reuse parts or whole models in future designs.



ReqIF

Collaborative MBSE

MBSE adds tremendous value where multiple stakeholders need to collaborate, including domain experts and end-users. It enables a single, authoritative point of truth, which helps to avoid mistakes in 'copying' information from one document to another – this has always been the starting point for MBSE and a baseline in our approach.

Our experts enable teams to adopt a collaborative model-based approach across the life cycle, from early stage design onwards, whatever tools, languages and standards they prefer to use, including Capella, CDP4-COMET and SysML.

Trusted to deliver

We deliver MBSE services to space agencies and critical infrastructures, including applying MBSE to projects for the European Space Agency (ESA):

- **CDP4-COMET at ESA's Concurrent Design Facility** – CDP4-COMET is the collaborative MBSE tool suite used by ESA to perform its concurrent design studies and activities.
- **Digital Engineering Hub Pathfinder** – Development of a series of adaptors to support data exchange between other engineering tools and CDP4-COMET. The following adaptors have been developed in this R&D project: Capella, SysML (Enterprise Architect and MagicDraw), Catia, EcosimPro, Matlab, STEP TAS.
- **MBSE Hub** – A virtualised central hub to streamline the design and execution of space projects to provide semantic interoperability between multiple stakeholders and their tools. The MBSE Hub is an implementation of the Space System Ontology.
- **ESA SysML Solution** – The ESA SysML solution provides a methodology following ECSS to be used in SysML tooling such as Enterprise Architect and Cameo System Modeller. Both the profile and customisations to the tools are delivered.
- **PASaaS** – Development of a web-based product assurance (PA) tool suite to support the PA processes used by ESA.

MBSE services

Starion's MBSE experts offer a broad range of services. Our portfolio includes expertise in multiple MBSE languages and standards such as Capella, SysML v1 and v2, ReqIF and ECSS-E-TM-10-25A, the ECSS standard underlying our CDP4-COMET platform. We are closely following the development of SysML v2 and this is being adopted in our portfolio and MBSE tools as the standard evolves.

Our services include:

- **MBSE training:**
  - General MBSE
  - SysML v1
  - Capella
  - CDP4-COMET.
- **Modelling support in MBSE projects** using SysML v1, Capella and/or CDP4-COMET.
- **Domain-specific tool integration** – Assisting or completing development for the integration of existing software applications in an MBSE environment to ensure digital continuity of MBSE models.
- **CDP4-COMET Community and Enterprise editions** – The Starion concurrent design platform is used to create multidisciplinary models and exchange data between concurrent design experts according to ECSS-E-TM-10-25 standards.
- **Consulting** – Advice and support to help your organisation adopt MBSE and gain the full range of benefits from it.

MBSE resources

Visit our website to discover our full set of MBSE resources, including open source software libraries and tools

STARION

About us

Starion provides engineering expertise and solutions for space, defence and other critical infrastructures across Europe. Our teams work on world-leading space projects that deliver pioneering missions that provide us with the information and technologies we use today.

Starion offers over three decades of expertise in system engineering and professional engineering services, developing and operating systems and solutions tailored to our clients' needs. Our teams work across the complete space mission life cycle, and in data utilisation and archiving. By combining space and system engineering with established and emerging technologies, such as artificial intelligence (AI) and quantum, we produce innovative solutions that make a fundamental difference for our clients and for society. Our MBSE services and broader digital engineering capabilities are key elements in our overall market offering.

Starion's employees are located across Europe, close to our clients' offices, enabling us to be responsive and agile. Our engineers and researchers are among the most trusted and respected in the industry, helping to build space-based solutions that address major challenges on Earth such as civil security, climate change and deforestation.

STARION

Starion Group SA, Rue des Etoiles 140, 6890 Libin, Belgium

To find out more visit **starion**group.eu or get in touch **info@starion**group.eu

stariongroup.eu