

The Capgemini logo, featuring the word "Capgemini" in a blue sans-serif font, followed by a blue circular icon with a white stylized shape inside.

Capgemini

Virtual Engineering

Disrupting system engineering
with model based approach



Seamless modelling to foster time to market and digital continuity



Virtual engineering is the new enabler of system engineering evolving to virtual space to implement design thinking and product line management. It is based upon modelling, simulation and visualization and supports industry to face disruptive changes in product lifecycles.

It creates a global infrastructure that enables:

- A reduced time to market while ensuring cost, quality and performances
- A seamless integration of new technologies and innovation
- A collaborative and global environment from design office to manufacturing and operations

Virtual engineering aims at mastering the product development cycle and reducing risks and quality issues (iteration, rework) which represents a significant part of the development costs.

Clients' benefits:



Efficient management of product line roadmap by platforming and suggesting modular approach



Effective decision making by modelling & simulating complex behavior



Fast assessment of technical solution performance, innovation, cost and impact



Securing and verifying specification and interfaces prior to build



End-to-end view with advanced requirements management & simulation



Reducing inconsistencies by model sharing in global and collaborative environment



Optimize verification & validation



Anticipate issues (corner conditions, reproducibility)



Full Ecosystem of partners: CESAMES, dassault systèmes, spherea, argosim/stimulus, capella/a rcadia, MIT

Our comprehensive solutions:

- **Digital system architecture and design:**

System design, product variance analysis and definition, modular architecture definition, and product line roadmap

- **MBSE and simulation to ensure digital continuity and collaborative workspace:**

Standard model configuration, behavioural and detailed model generation (SysML, Matlab/simulink, C), real time simulation, and cosimulation management, DoE and smart surrogate modeling, model retrofit based upon design for manufacturing, data analytics, etc.

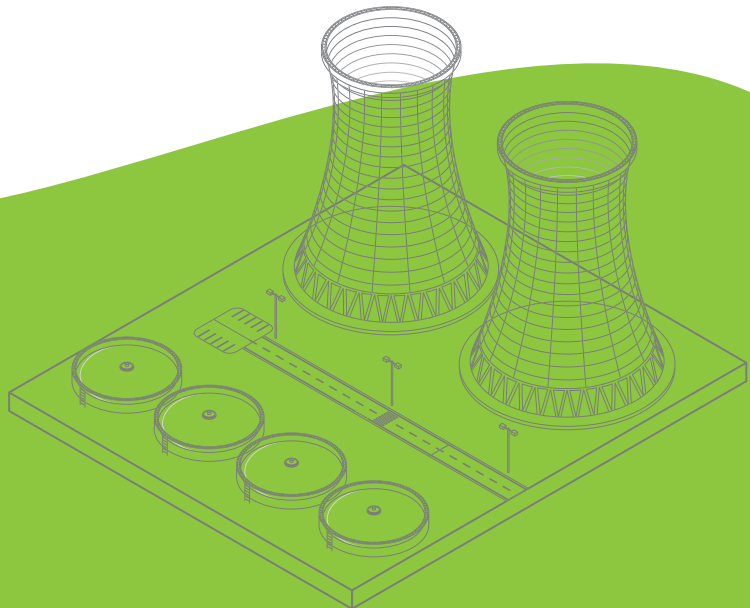
- **Virtual testing to anticipate and optimize validation:**

Definition of validation plan and test means, test protocol preparation, physical test plans optimization, HIL (Hardware in the Loop) deployment, test deployment and system integration

Our System Engineering tools are integrated with CAD and PLM environments, project management and workflow tools as part of a broader computer-aided engineering and enterprise management environment to enable Digital Continuity.

Our key differentiators:

- We own turn key solutions on system engineering and system management
- We run a MBSE demonstrator
- We are recognized as a leading PLM integrator





Digital framework

Virtual systems engineering and MBSE manage gap between design, simulation and tests phases while improving product quality with a minimum number of real tests.

Architecture and Design

Anticipate and check specification, assess cost and performance trade off prior to build

System architecture, design and analysis are integrated across disciplines domains and lifecycle phases to provide a single, consistent, unambiguous, system representation

Establish an efficient product line strategy per platforms and derivatives based on reuse

- Specifications
- Requirements
- Interface
- System design
- Analysis and trade-off
- Test plans

MBSE

The Virtual Engineering enabler is a reusable multi disciplinary modelling database

Reduce inconsistencies between specification, design, build and validation

MBSE (Model Based System Engineering): is the use of models as opposed to documents as the main artefacts of system development (system requirements, design, analysis, V&V)

Virtual design to MES and operations

Ensure data and models continuity to manufacturing and operations

Modelling and Simulation

Accelerate decision making process with complex system modelling and simulation:

- Create functional, behavioral and accurate models
- Interfaces to reproduce system behaviour in virtual (digital twin) through simulation core

Virtual testing

Integrate and validate quickly systems and partner ecosystem

- Increase test coverage
- Reduce the number of real test
 - Focus on critical real test or certification test
 - Definition of test means and prepare test protocol

About Capgemini

A global leader in consulting, technology services and digital transformation, Capgemini is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of over 200,000 team members in more than 40 countries. The Group reported 2018 global revenues of EUR 13.2 billion.

Learn more about us at

www.capgemini.com

About Capgemini's Digital Engineering and Manufacturing Services

Digital Engineering and Manufacturing Services Capgemini's Digital Engineering and Manufacturing Services brings together deep domain expertise to lead the convergence of Physical and Digital worlds through technology, engineering and manufacturing expertise to boost our clients' competitiveness. A recognized leader with over 10,000 engineers across the globe and 30+ years of experience, Capgemini's comprehensive portfolio of end-to-end solutions enables global companies to unlock the true potential of their product portfolios and manufacturing efficiencies.

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People matter, results count.

