



Leidos Model-Based Systems Engineering (MBSE)



Systems engineering is complex and challenging for most organizations. Trying to integrate different people, teams, departments, and data into one engineering project introduces a lot of issues that organizations struggle to deal with, much less solve.

By using model-based systems engineering (MBSE) instead, organizations can get a visual representation of the system they're working on, making it easier for them to visualize system interdependencies. MBSE is an agile approach that modifies the traditional document-driven systems engineering development lifecycle by using model development, reuse, and integration methods to help teams quickly respond to evolving systems engineering needs.

OUR APPROACH

Leidos' MBSE solution helps project teams quickly respond to evolving systems engineering needs through an agile, digital approach that modifies the traditional document-driven systems engineering development lifecycle by using model development, reuse, and integration. Each data element can be electronically associated with each other, creating a relationship-derived design model, which includes requirement, behavior/function, structure, and analysis parameter elements. This digital engineering approach replaces labor-intensive, document-centric processes, and allows the engineering teams to focus their efforts on the most vital engineering tasks.

The Leidos MBSE tools are not just model-centric; they can support the entire lifecycle of an engineering program. Because the data is related digitally, solutions, ideas, and processes can be quickly understood, and associations identified more efficiently. Engineering analyses such as trade studies, requirements management, performance modeling, interface definition, verification, and impact analysis are analyzed, developed, and deployed more efficiently to any project stakeholder, both internally and externally.

OUR CAPABILITIES

Leidos's MBSE Center of Excellence (CoE) enables us to offer this capability at scale. The MBSE CoE supports Leidos through centralized program support, focus on adoption and transition, and developing enterprise maturity.

Our MBSE approach provides increased flexibility to manage system complexity, improved communications, improved knowledge capture, superior system quality, and reuse of information throughout the project lifecycle. It supports both hardware and software projects, as well as testing capabilities for test design and modeling, pre-implementation testing, and test scenarios development.

MBSE increases engineering team productivity throughout a project lifecycle since it reduces the time systems engineers spend manipulating documents, tables, and spreadsheets. Engineers can analyze and implement changes with less effort and errors and can analyze and implement changes faster than before.

Project risks are significantly reduced as well since proposed changes are assessed more quickly, and any integration obstacles are identified earlier in the project lifecycle. Because the information is stored centrally in MBSE, configuration control of technical elements is easier to manage – it only has to be updated once, and it's propagated throughout the project immediately. The centralized nature of information and data elements in MBSE also makes communication and collaboration easier for the project team. MBSE data acts as the single source of truth for the project, reducing the likelihood of errors and miscommunication since everyone's working from the same information.

FEATURES	BENEFITS
Includes reusable and well-defined templates for common portfolio elements and patterns of system behavior and complex structural configurations.	Increases productivity of all stakeholders throughout the project lifecycle as data can be created more quickly and efficiently, and it's distributed immediately through the tool.
Captures and places the baseline under strict configuration management in a systems engineering modeling tool.	Improves the integrity of the engineering baseline by restricting access to the data elements to only those who need it.
Defines system model artifacts once and uses them throughout the project lifecycle – the single artifact is propagated everywhere it is used within MBSE. Engineers can "define it once, use it many times" in MBSE.	Improves the quality of data being used by the project and reduces the amount of time engineers must devote to document and data management.
Allows for a faster and more comprehensive assessment of proposed baseline changes.	Reduces risk for projects by reducing the time it takes to assess and update systems engineering artifacts.
Provides a structured environment in which engineers can describe and make changes to systems functions and components in model variations since they're each managed as a separate configuration.	Enables innovation since engineering teams can make changes to models independently of final designs or projects. They can innovate without fear of negatively impacting production code or solutions.
Acts as a single system model that is the authoritative source of all technical baseline information for a system or project.	Enables more consistent technical baselining of systems engineering, eliminating any duplication of modeling, design, or analysis.

PROVEN SUCCESS

As an overall technical approach, MBSE was highlighted as part of the **International Council on Systems Engineering (INCOSE) vision for 2020** and their white paper forecasting their vision for **2025, A World in Motion**.

Customers use MBSE to support both hardware and software projects and use its testing capabilities for test design and modeling, pre-implementation testing, and test scenarios development. Leidos has also proposed to use our MBSE solution in several military, aerospace, and aviation settings, offering to help these organizations optimize, maintain, and manage their large IT network architectures more efficiently.

WHY PARTNER WITH LEIDOS?

Leidos has extensive experience in systems engineering and in using the tools that power it. Leidos' MBSE integrates with our Engineering Edge® NextGen solution to ensure optimal technical artifacts and program deliverables.

NEXT STEP

To learn how Leidos MBSE can improve your systems engineering productivity and system quality, reduce project risk, enable design innovation, and let your systems engineers dedicate more time to actual engineering, contact our MBSE team today.

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