Massachusetts Institute of Technology

Model-Based Systems Engineering: Documentation and Analysis

Key Takeaways

WEEK 3: CRITIQUING AN MBSE APPROACH

MBSE Challenges

MBSE not only requires technical system information to be included in the common model, but also requires infrastructure, processes, and management effort. Some potential challenges to be aware of in the process of conducting a critique include:

- Integrating legacy products and models into the MBSE model
- Quantity of data to be handled by the model
- Upfront investment to design, develop, and implement an MBSE approach
- Building a cadre of employees with modeling and software skills
- Process definition and adoption by the different multidisciplinary teams
- Team training on MBSE processes and tools

Potential Rationales for Performing an MBSE Critique

- Verify and validate the model for a given project, potentially as part of a non-advocate review
- Evaluate the current state and achievements on an MBSE effort to determine whether it requires or would benefit from additional funding
- Evaluate whether a sister project should adopt the MBSE approach based on the current MBSE efforts
- Evaluate a tool vendor

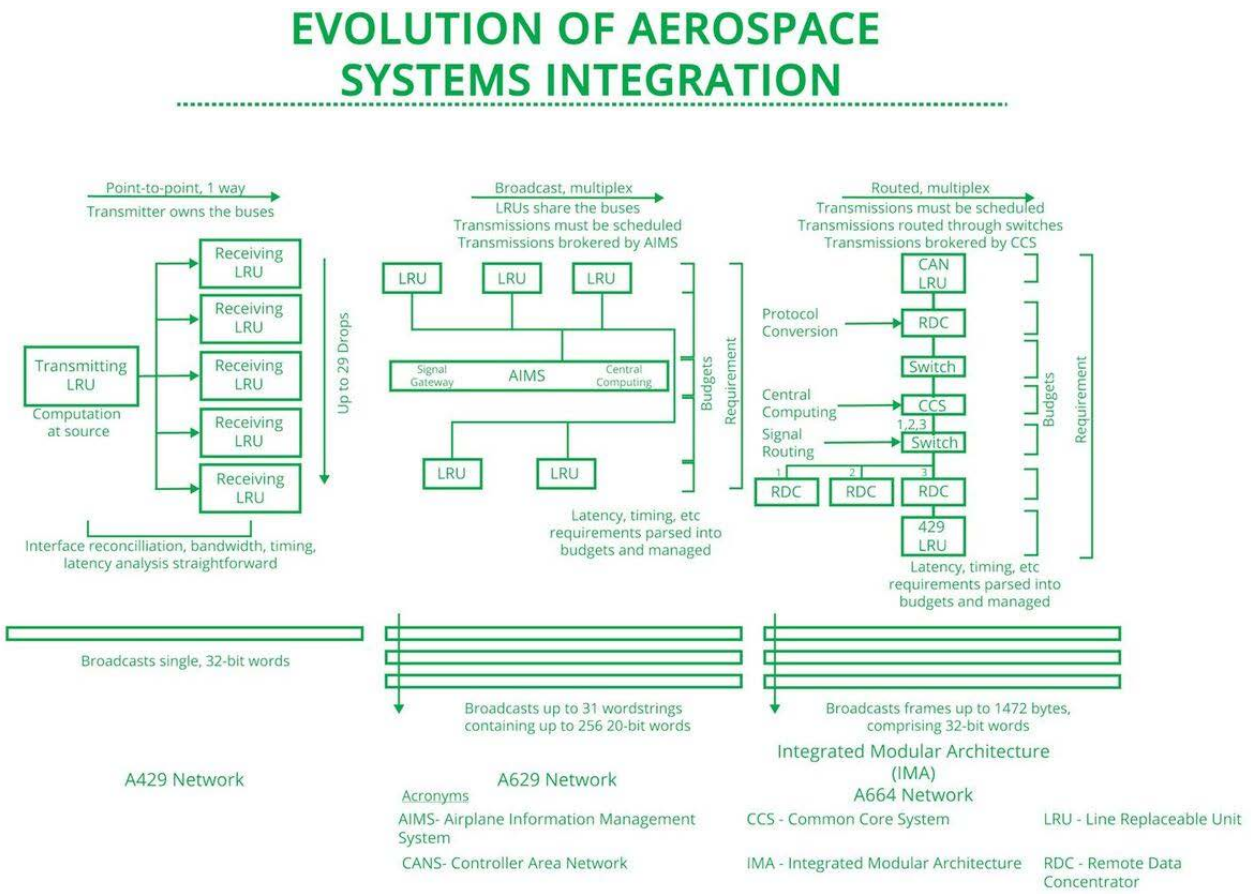
Structured Process for Exploring the Model During a Critique

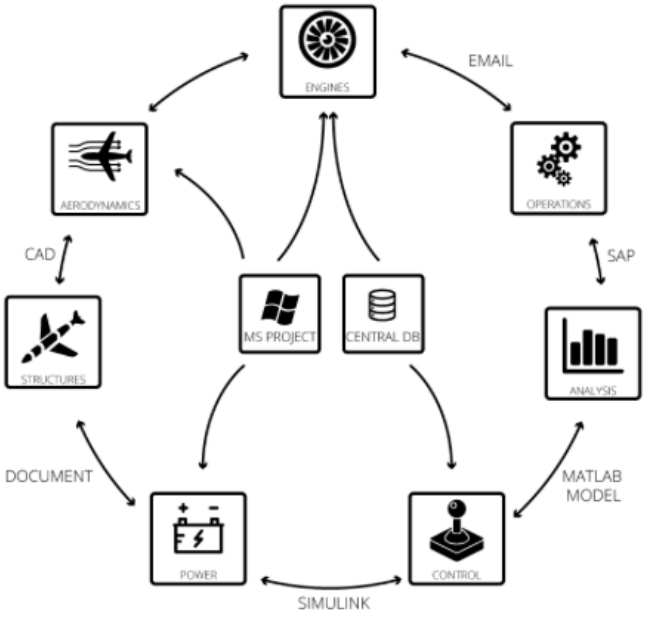
- Functionality and Use Cases
- Structure of the Model
- Interfaces
- Dependability and Failure Modes
- Concurrency Analysis
- Management and Deployment
- Review Against Qualities of Great Models

Output of the Critique

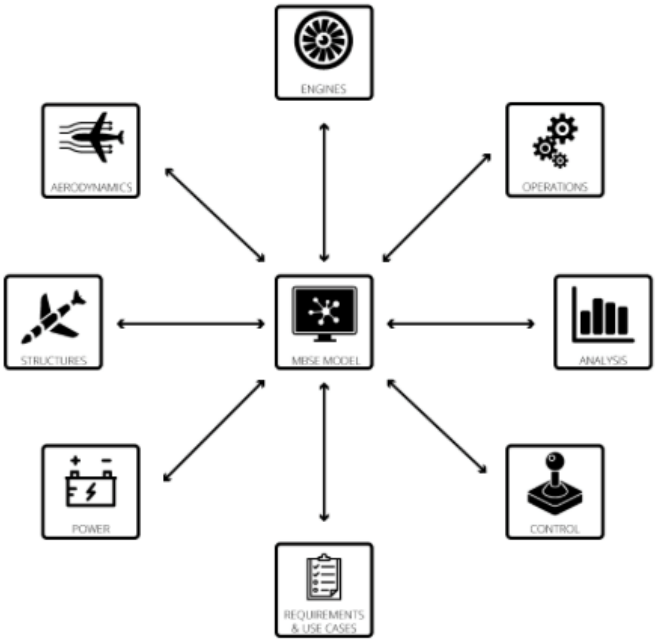
- Remarks on whether the model is meeting the intended scope and purpose.
- Set of observations and data on the model's strengths and weaknesses. Your findings should relate back to specific instances of the model with data sampling to backup your feedback.
- An evaluation against each of the qualities of great models, as well as supplementary behaviors or qualities you believe are relevant for an MBSE model.
- Conclusions and recommendations for the specific rationale for the critique.

Critiquing an MBSE Approach > Implementation Challenges of MBSE > Case Study: Boeing 787 Wiring

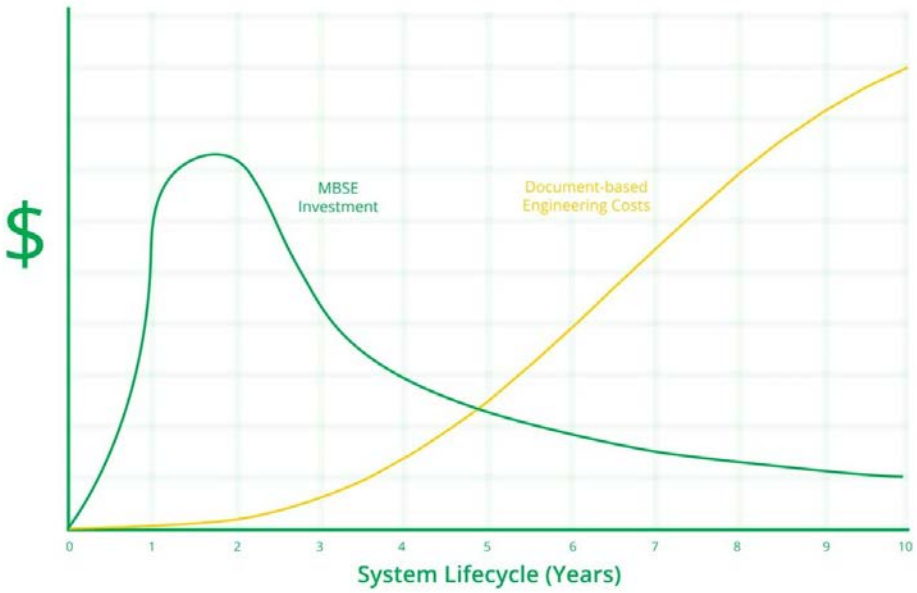




As projects grow in both complexity and scope, integration across teams and components becomes a major challenge in the product development cycle. The next image represents an MBSE approach.



Critiquing an MBSE Approach > Performing an MBSE Critique > Purpose of Critique in MBSE



Critiquing an MBSE Approach > Performing an MBSE Critique > Performing a Critique in MBSE