

# Using MBSE

Lessons from a real world implementation

# Why make a model?

- To see what a design will look like (literally or figuratively)
- To show a proposed design to other people
- To refine a design based on feedback about the model
- To analyze potential problems with a design
- To save time and money by NOT implementing a bad design!
- To understand and simulate the behavior of a process or a mechanism

*Models are an essential design tool!*

# Barriers to implementing MBSE

- Time and effort required to learn to model well
- Poor tools
- Complex or inappropriate methodologies for modeling
- Quality Assurance systems that require text based documents
- Reluctance to change established ways of working
- Large up-front costs for benefits that are long term
- The expectation that MBSE is a silver bullet that creates good designs

*Work with management to reduce these barriers!*

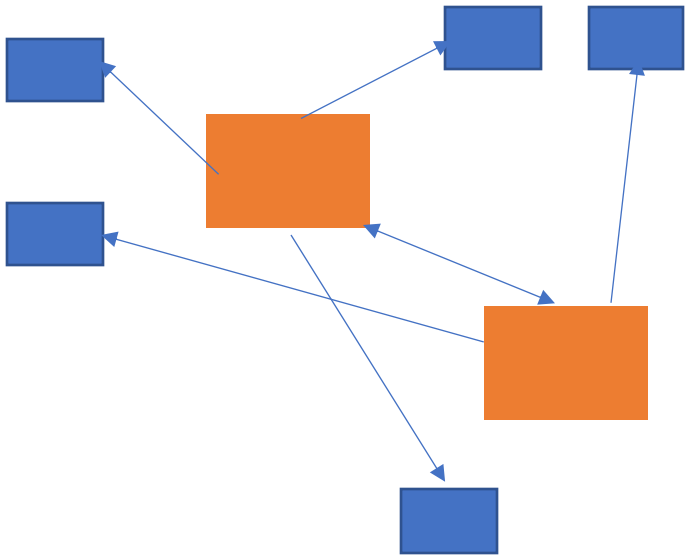
# Lessons learned from mentoring modelers

- Group Review: Have other people review your models. Learn from their comments. And learn from their models too!
- Nomenclature: Choose names that correctly describe the object and are consistent with other names in the model.
- Layout: Use spatial thinking to make your model layout communicate the design. Messy layouts often indicate a poorly-thought out design.

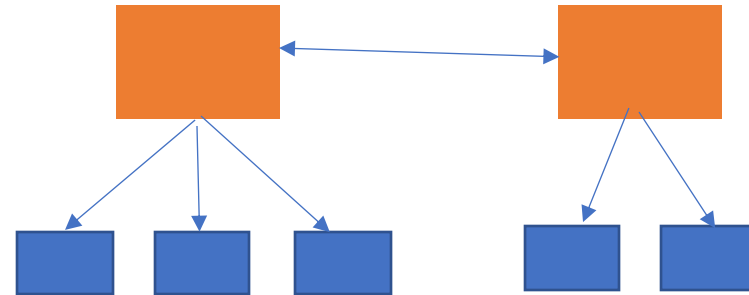
*Make your model communicate your design clearly!*

# Layout communicates design

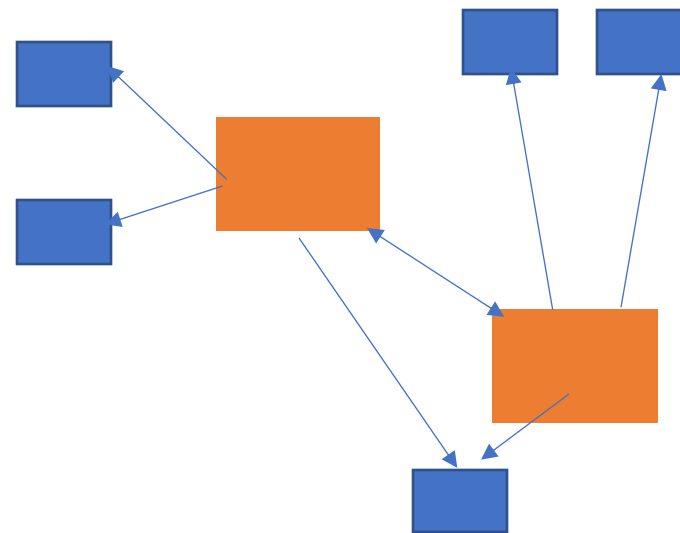
Layout that doesn't match design



Layout that matches design



Design that matches layout



# Opportunities

- MBSE tools make it much easier to describe, communicate and update designs than traditional text-based documents.
- MBSE tools allow you to simulate a design. Simulation reveals logical gaps and inconsistencies BEFORE implementation.
- MBSE tools can be integrated with automated testing systems. One model can replace both requirements and test protocols.

*There are many ways that MBSE can be used to improve productivity!*

# References

- SysML Distilled by Lenny Delligatti
- A Practical Guide to SysML by Sanford Friedenthal, Alan Moore and Rick Steiner
- The Visual Display of Quantitative Information (Second Edition) by Edward R. Tufte