Breakout Session: MBSE Education and Research

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1: Which KSAs?

- What are the differences in the Knowledge, Skills and Abilities (KSAs) needed for MBSE vs. traditional SE?
- What are specific KSAs desired for MBSE?

- Abstraction v. approximation
- Which level of abstraction / approximation?
- Object-oriented thinking
- Modeling patterns
- Modeling in teams
- Meta-modeling
- Modeling not diagramming…

2: How?

- What is the relative importance that should be attributed to these Knowledge, Skills and Abilities in the curriculum?
- How can these KSAs best be introduced in the curriculum?
- How best to approach an “MBSE Course”?

- Focus on modeling fundamentals, not tools (only a means)
- Focus on semantics, not just syntax — diagramming is not modeling
- Modeling taught in an “MBSE course”, but used & reinforced in subsequent courses, especially project courses
- May be desirable to teach a company or context-specific language (ontology or profile)

2: How?

- What is the relative importance that should be attributed to these Knowledge, Skills and Abilities in the curriculum?
- How can these KSAs best be introduced in the curriculum?
- How best to approach an “MBSE Course”?

- Provide students with best-practice patterns
- SE should remain the main focus — no modeling for modeling’s sake → model should add value
- Frame modeling in broader context of integrated tool chain

3: Assessment

- How do we best assess MBSE proficiency?

- Grading is a pain in the *?!
  - → Get a good TA (Thanks, Sebastian! ☺)
  - → Peer review
- Work with experienced mentors (from industry)
- Assessing model quality
  - → Ultimate goal: support SE
  - → Project with final design review
  - → Presentation using model
  - → Traceability
  - → Correct use of semantics, not just syntax

4: Curriculum

- Should MBSE become an integral, mandatory component of SE curricula?
- Should MBSE be taught at the undergraduate level?

- In the (near) future, we will no longer talk about Model-Based Systems Engineering
  → “MB” will be implied
- Teaching SE at the undergraduate level may be too early
- But teaching modeling → even in K-12

5: Action Items

- Develop and share educational modules
  → How to introduce modeling in other SE courses?
- Develop and share libraries
  → Best practice examples
  → Ontologies, QUDV, etc.

- To pursue these action items: Create new MBSE Activity Team on “MBSE Education”
  – If you are interested in kicking this off, get in touch with Sandy and Mark

Research