NAFEMS / INCOSE
Systems Modeling & Simulation
Working Group
▌▌French section SMSWG

A unique opportunity for the international
Engineering Analysis (CAE) and Model Based
Systems Engineering (MBSE) communities
to work together

French team start in 2020 : NAFEMS-AFIS

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A unique opportunity for the international
Engineering Analysis (CAE) and Model Based
Systems Engineering (MBSE) communities
to work together

- Kick off meeting on 15th of May 2020
- 5 meetings
- 17 members at least :

  - NAFEMS, AFIS, IRT SystemX, IRT St Exupery
  - Renault, PSA, Nexter
  - Thales, Safran tech, Dassault Aviation, Airbus
  - Naval Group,
  - Schneider electric
  - Samares engineering, DPS, SYS4cil

- Same objectives

- Coordination with SMSWG (NAFEMS-INCOSE)

Context

Resume of context

1. Complexity of systems (with an acceleration)
2. Collaborative activity (in a complex organization and various cultures)
3. Agile mode (with or without spec adaptation)

Finality

Ease the closed loop
Specifications => Design => Evaluation
<=

- Synchronization of different process
- Simulation with high level of abstraction or heterogeneous fidelity

A bridge :

| System definition | Bridge | System simulation |

System definition

Modeling
- **Complexity of systems**
- **Collaborative activity**
- **Agile mode**

Abstract representation

Bridge

Modeling behavior

System simulation

Simulation of behavior
- **Complexity of systems**
- **Collaborative activity**
- **Agile mode**

Virtual prototyping (MIL+XIL)

Design

Analysis : Evaluation vs spec

Specification

Evaluation

A bridge :

System definition

Modeling
- **Complexity of systems**
- **Collaborative activity**
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Abstract representation

Bridge

Modeling behavior

System simulation

Simulation of behavior
- **Complexity of systems**
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Virtual prototyping (MIL+XIL)

Architect system

Architect simulation

Decision

Design

Analysis : Evaluation vs spec

Evaluation

Specification

Mechanic
Energy
Vibrations
Optic
Electr.
+ control
+ communication

Finality and benefits

System definition

What are the benefit to model functions

Modeling

Requirement, functional, logical, physical

- Traceability
- Various context
  - Specification check
  - Choice of architecture
  - Verification of design
  - Validation of design
  - Optimization
  - …..
- Diversity management

Bridge   ?

What are the benefit to transform models of function in model of behavior ?

Modeling behavior

- **Specification of simulation**
  - Simulation for what ? (decision)
  - Fidelity objectives
- Availability of complex models
- Digital continuity
  - Traceability
  - Automatization
- No-rework (agile)
- Initialization of architecture & models

System simulation

What are the benefit to make simulation of behavior of systems

Simulation of behavior

- Management of models
- Confident interval

- Traceability (model)

- Diversity management

Decision

Design

Specification

Analysis : Evaluation vs spec

Fidelity

Evaluation

Future works

- <u>Objectives</u>
    1. Bridge topics
        - Fidelity or quality regarding the support decision making
        - Initialization, change management
        - Traceability (which models ?)
    2. Glossary, lexicon
        - Architecture
        - Models
    3. Methodologies
        - Model exchange : MIC
        - Architecture transfer/transformation
        - Other diagram