Rationale, Context, Status, and Future Plans

MoSSEC (AP243) ISO Standard

Gregory Pollari, Collins Aerospace (America Co-Chair)

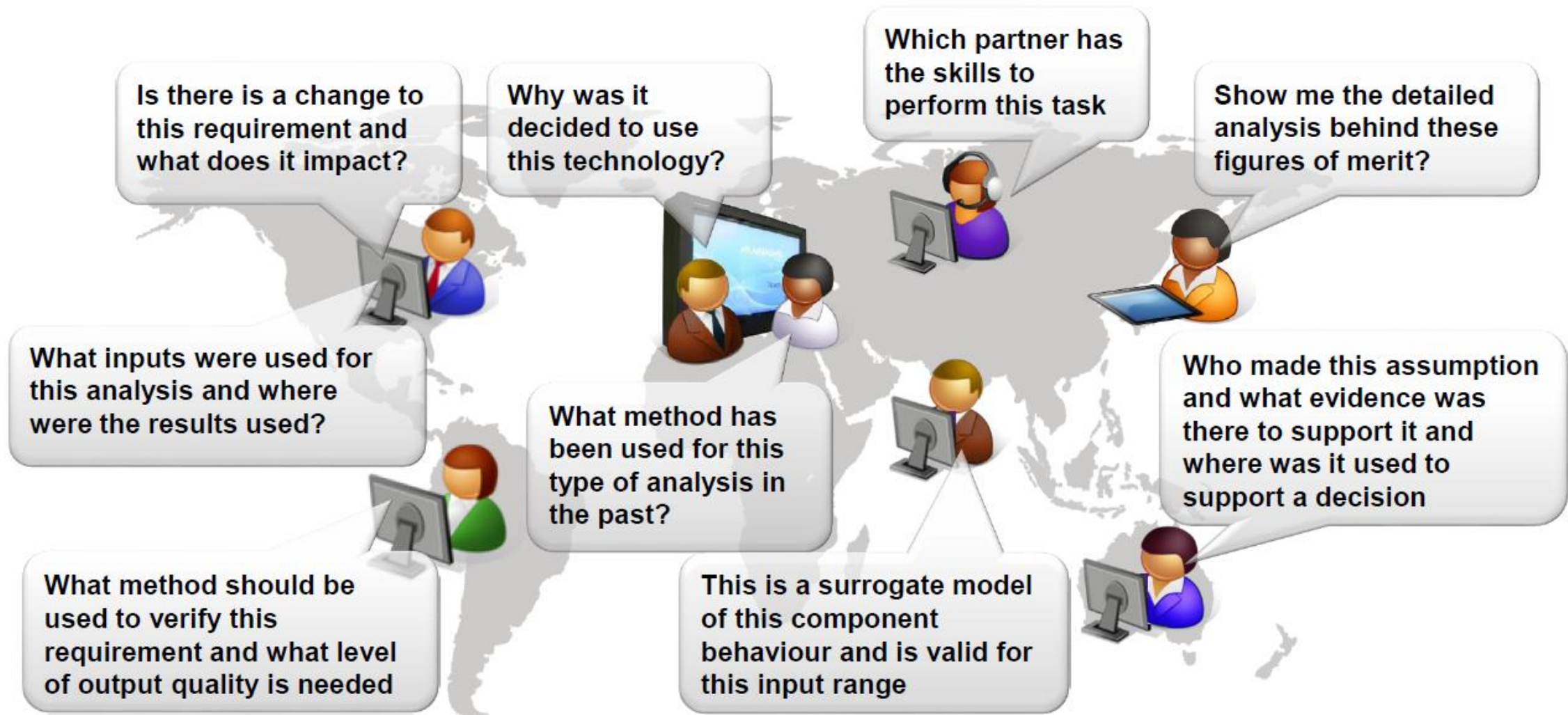Adrian Murton, Airbus (European Co-Chair)

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Agenda

- Why do I need MoSSEC?
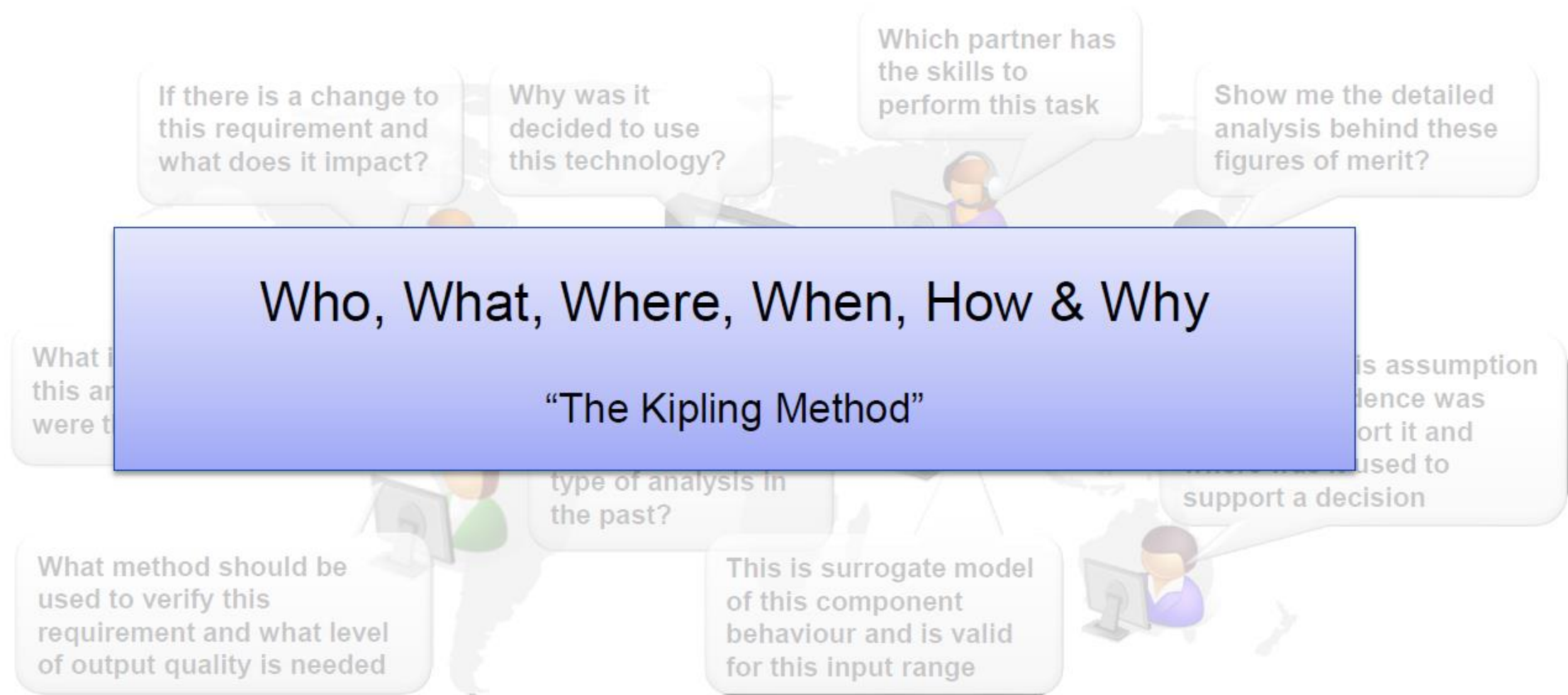
- What is MoSSEC?

- How is MoSSEC used?

- Summary

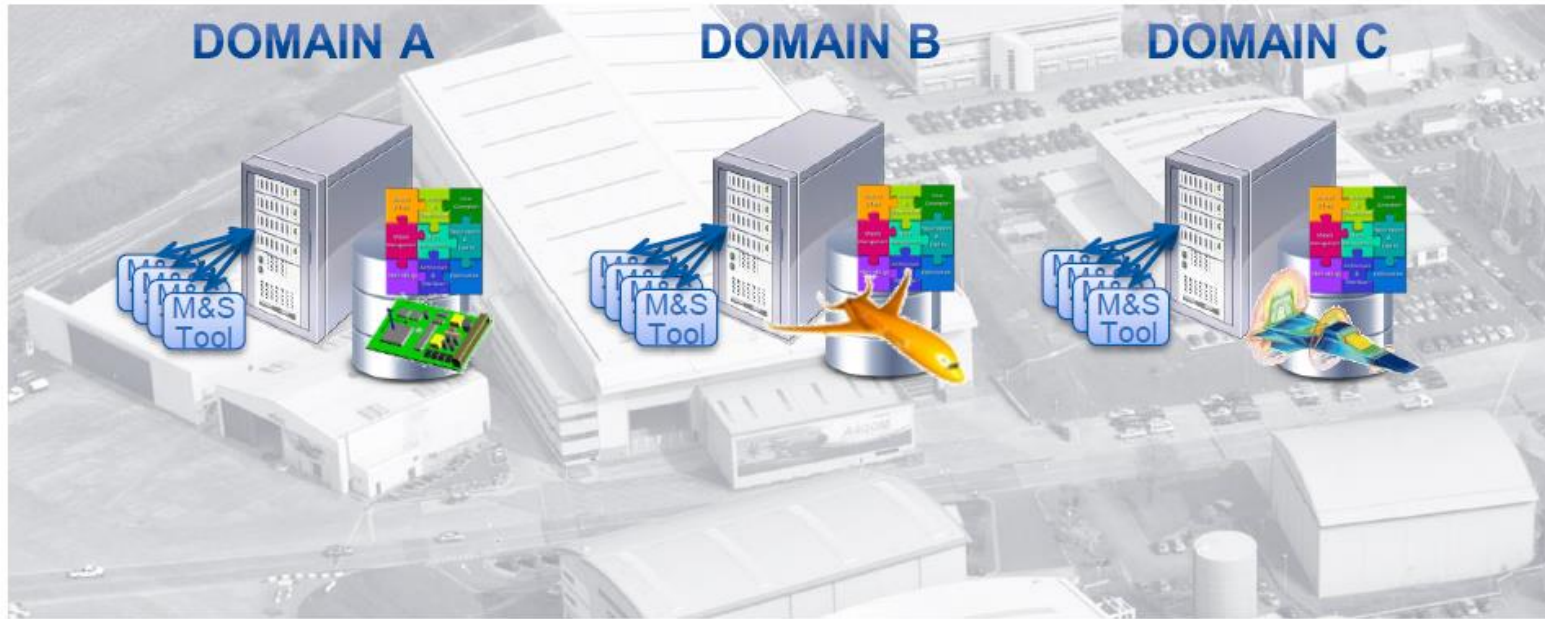Understanding the Need Before Defining a Solution

Why do I need MoSSEC?

Typical Decision-Making Questions

Typical Decision-Making Questions

If there is a change to this requirement and what does it impact?

Why was it decided to use this technology?

Which partner has the skills to perform this task

Show me the detailed analysis behind these figures of merit?

Who, What, Where, When, How & Why

"The Kipling Method"

What method should be used to verify this requirement and what level of output quality is needed

This is surrogate model of this component behaviour and is valid for this input range
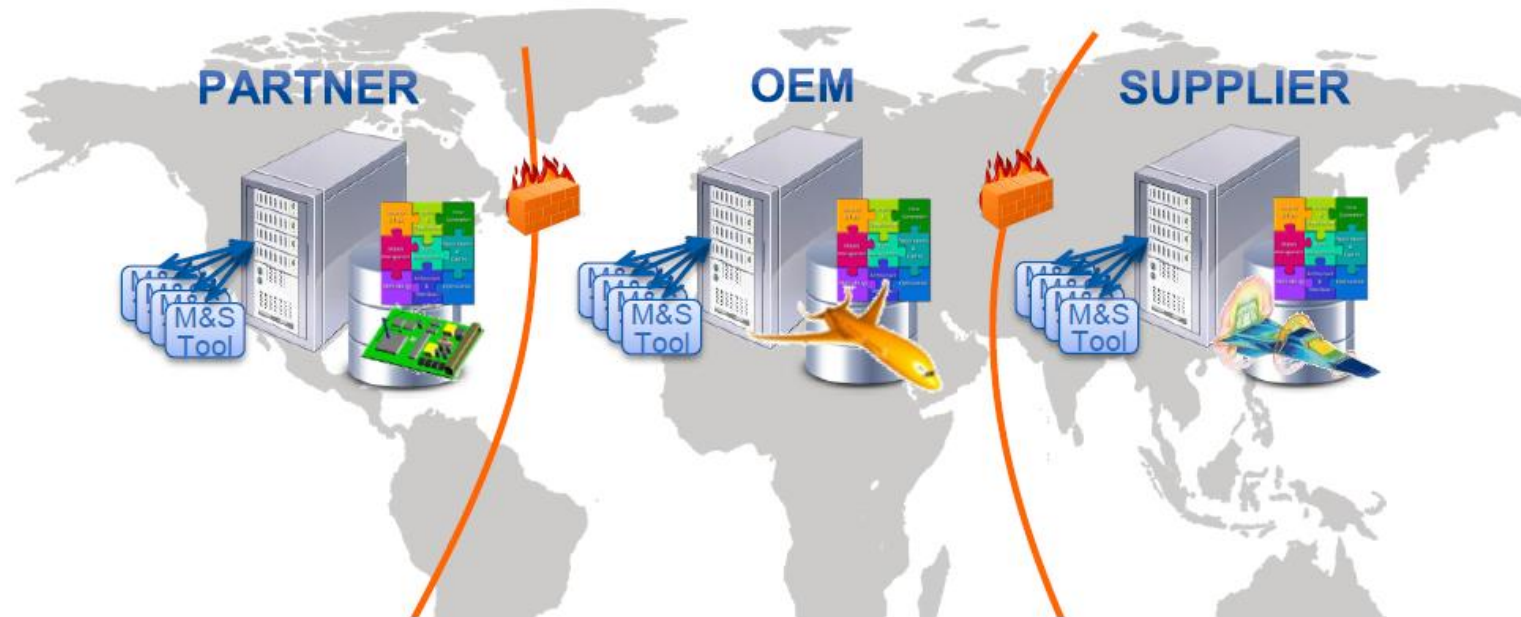
Improved Decision-Making Across an Organization

- Need efficient distribution and retrieval
  - Of system-of-systems definition
  - Across multiple organizations, platforms and locations
- Facilitate a joined-up big-picture view

Improved Decision-Making Across an Extended Enterprise

- Need efficient distribution and retrieval
  - Of system-of-systems definition
  - Across multiple organizations, platforms and locations
- Facilitate a joined-up big-picture view

Combine Modeling & Simulation Data with Collaboration Data

Modeling and simulation data

- Managed with PLM/SPDM* tools
- Standards-based exchange

Collaboration data

- Managed with MoSSEC-compliant tools
- MoSSEC standard-based exchange

* Product Lifecycle Management/Simulation Process & Data Management

A Data Exchange Standard for Model Metadata

What is MoSSEC?

A Work-in-Process ISO Standard

- ISO Committee Draft: approved June 2018 (ISO/AWI 22071, AP243)
- Draft International Standard: send for ballot July 2019 (earliest expected)
  - Dependent on STEP Extended Architecture validation and STEP Module Resource Library release
- International Standard: 2020 (planned)
- Contributing web services specification for the STEP Extended Architecture
- Industrial partner support (e.g. Airbus, Collins Aerospace, Boeing, BAE Systems)
- Vendor support (e.g. Eurostep, Dassault Systèmes, MSC Software, Siemens)
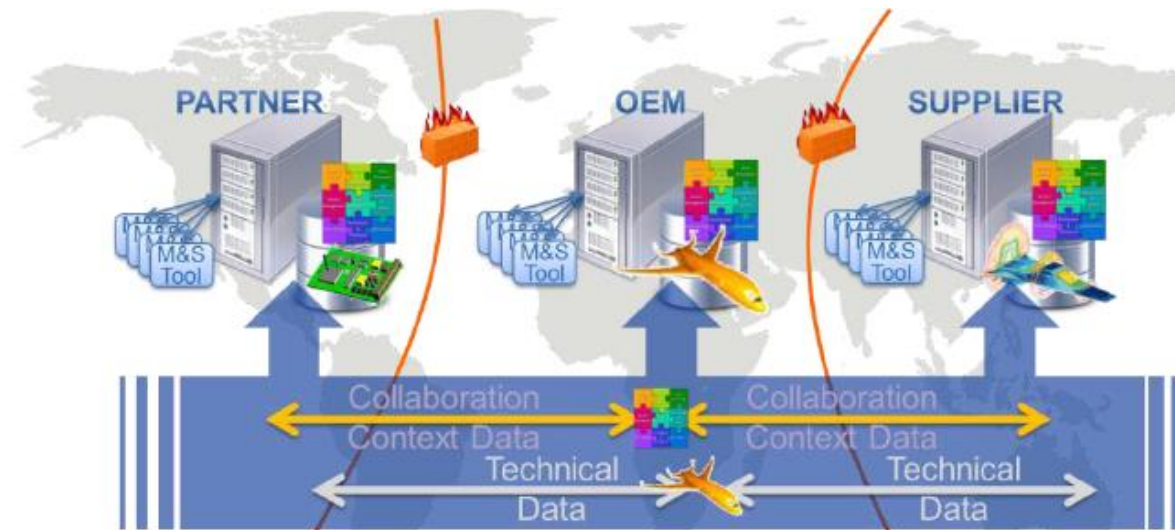
Business Object Model Coverage for Model Metadata

Built on Related Standards
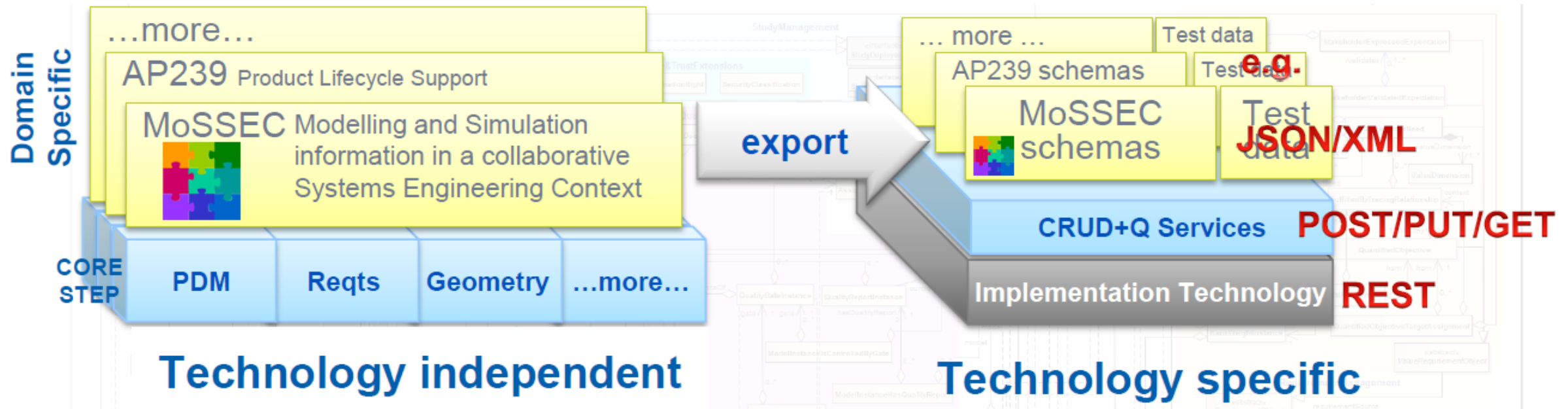
- **ISO 10303 STEP modular architecture (model-based)**
  - Mapping to Core, sharing subset with AP239 (PLCS*), harmonized with AP242 ed2
  - Allows for alternative technology-specific implementations – "future-proofing"
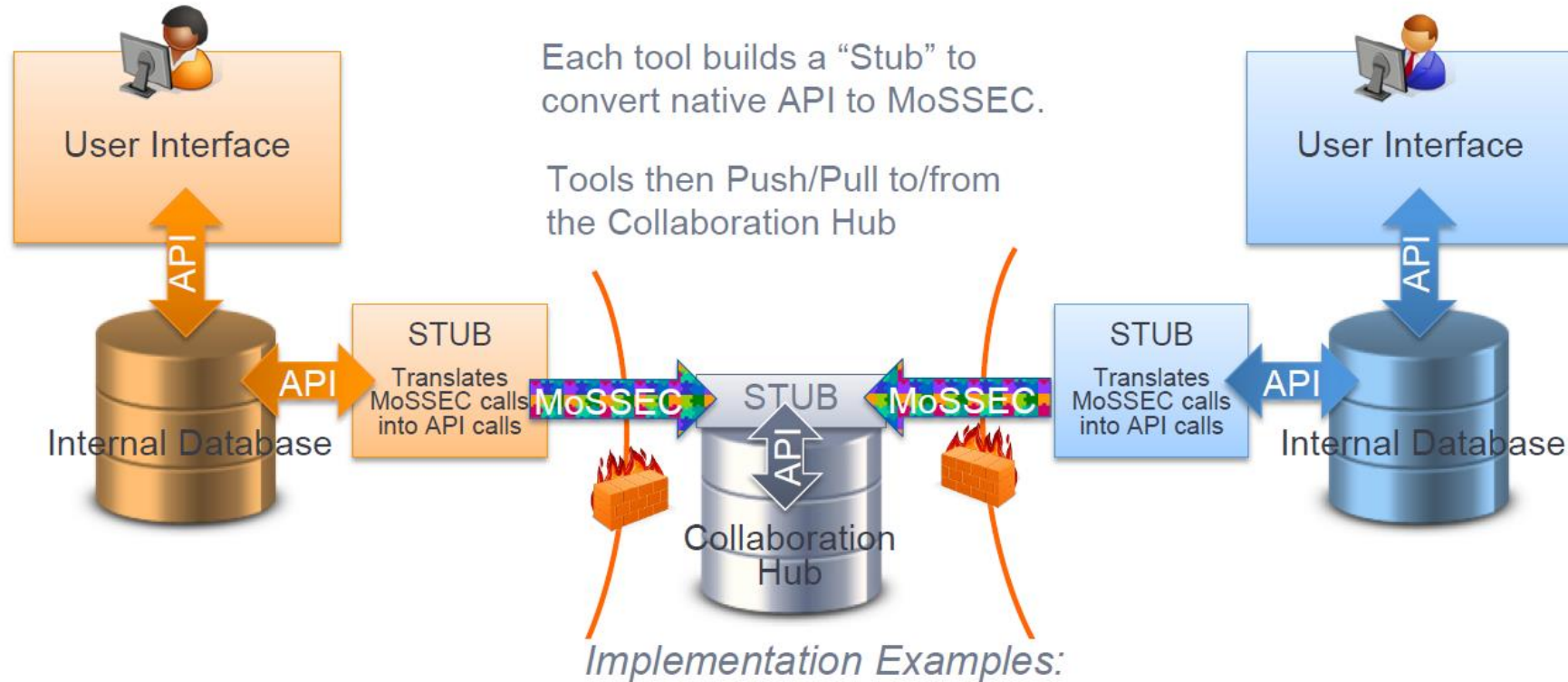- **Model-based definition enables test suite export for implementers**

* Product Life Cycle Support

Examples

How is MoSSEC Used?

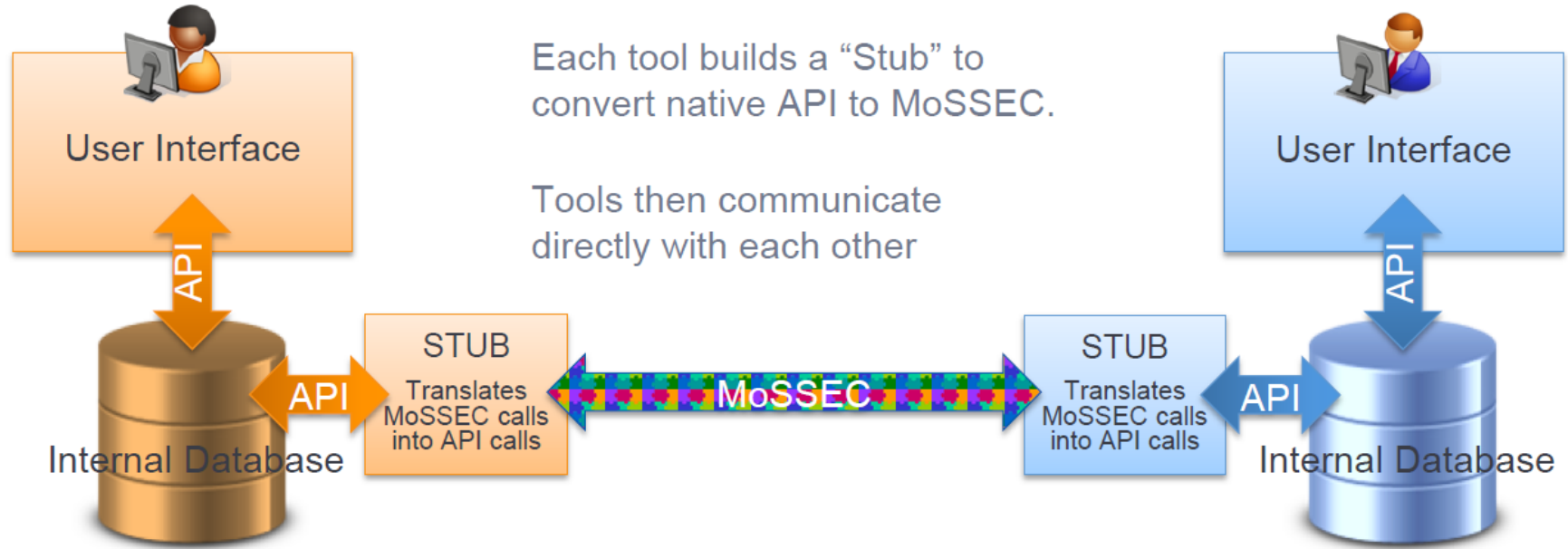# Implementation Scenario – Intermediate Collaboration Hub Communication

Each tool builds a "Stub" to convert native API to MoSSEC.

Tools then Push/Pull to/from the Collaboration Hub

User Interface

API

User Interface

API

STUB
Translates MoSSEC calls into API calls

Internal Database

API

MoSSEC

STUB

API

Collaboration Hub

MoSSEC

STUB
Translates MoSSEC calls into API calls

API

Internal Database

Implementation Examples:

Windchill (PTC)

SimManager (MSC)   →   ShareAspace (Eurostep)

Non COTS (various)

Implementation Scenario – Direct Tool Communication

Each tool builds a "Stub" to convert native API to MoSSEC.

Tools then communicate directly with each other

User Interface

API

Internal Database

STUB
Translates MoSSEC calls into API calls

API

MoSSEC

STUB
Translates MoSSEC calls into API calls

API

User Interface

API

Internal Database

Implementation Examples:

3DX (Dassault Systemes)	⟷	TeamCenter (Siemens)
3DX	⟷	SimManager (MSC)
Non COTS (various)	⟷	SimManager

Typical Application Area – Aircraft Design Trades

Typical Product Development Cycle

Feasibility | Concept | Design | Integration & Qualification

Single domain
Exploring rapidly loads of concepts

Multi-domain
Trade-Off analysis across a set of concepts involving rapid domain M&T

Multi-domain
Designing one concept in detail

Discipline silos

No means to steer trade process

Key information trapped in reports

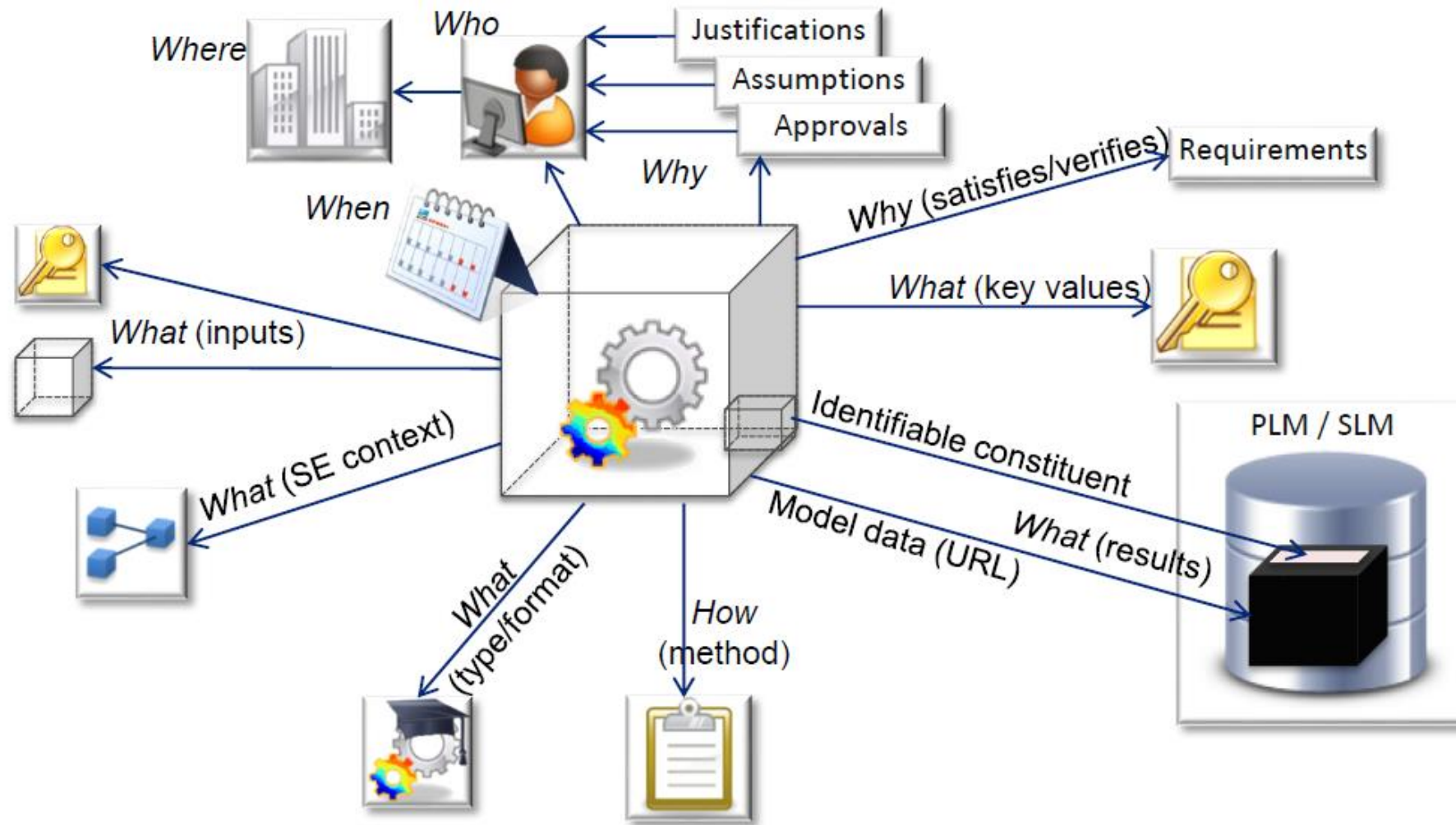Incoherent & not traced data
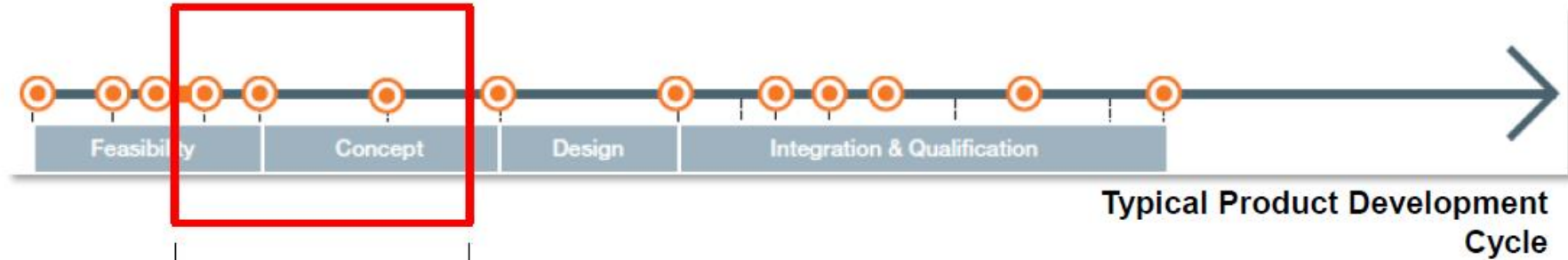
Fractal Studies and Associative Model Networks – Context Illustration
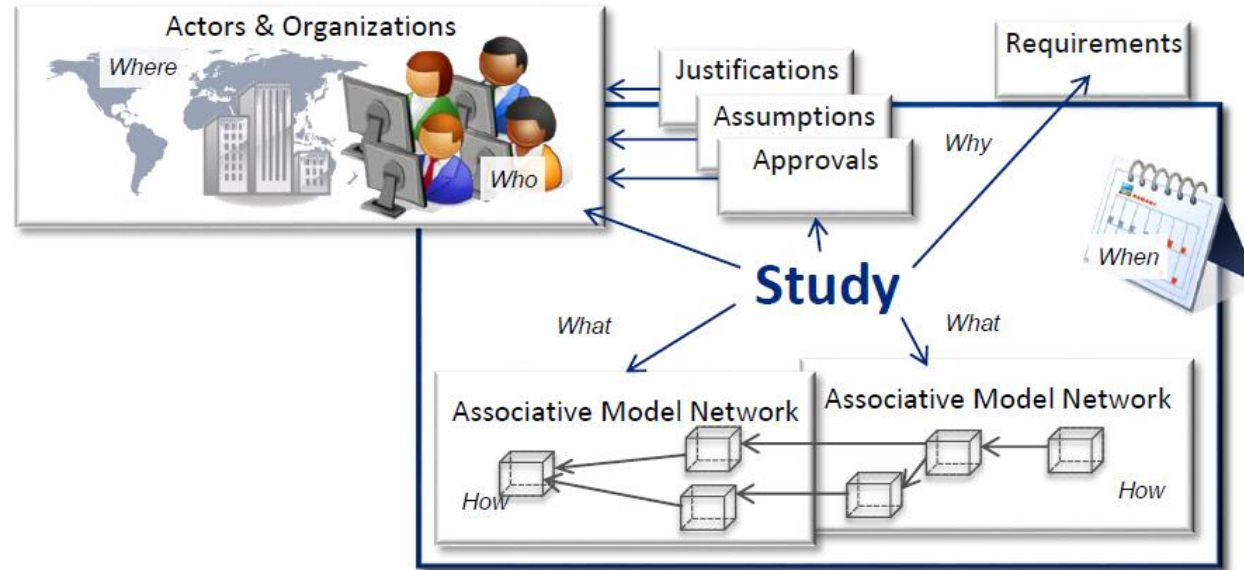
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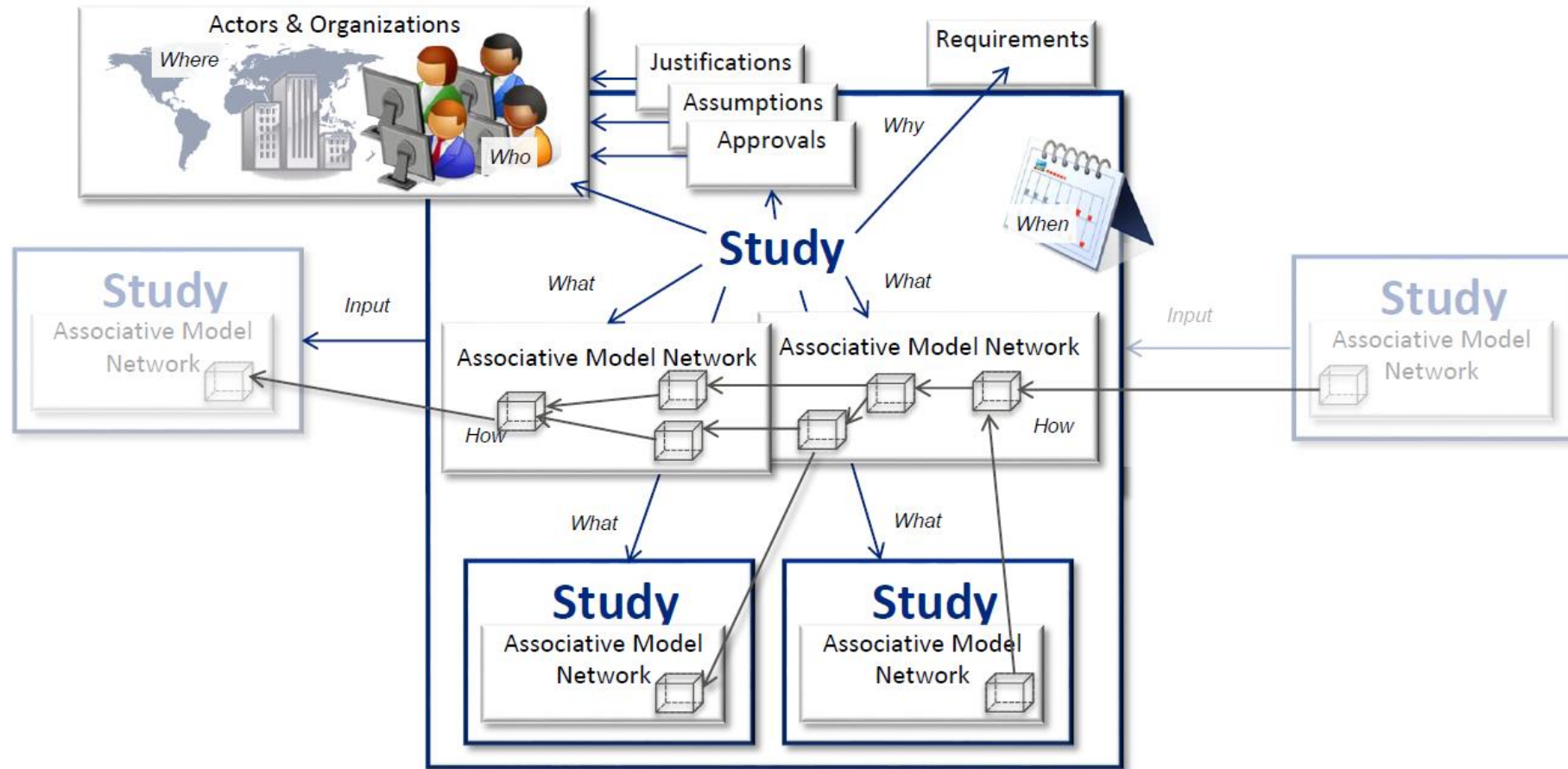
"Model Instance" – Context Illustration
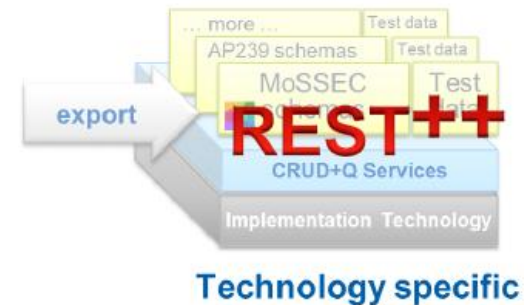
Benefits and Observations

- ## Development lifecycle
  - Initial development
    - Mapping to internal data model
    - Services development
  - Subsequent development
  - Implementation reuse

- ## Technology-independent model of standard
  - SOAP to REST without changing (for example)

- ## Standardized semantics and services
  - Improved collaboration, traceability, and decision-making

Summary

# MoSSEC: A Unique Combination of Features

- Links modeling and simulation to the Systems Engineering Context
  - Uses objects at a business level

- Efficiently shares context information
  - Uses web services defined by the business object specification

- Builds on existing standards
  - Uses STEP Extended Architecture map;ing to ISO 10303 AP239 PLCS and the Core Technical Capabilities
  - Exploits AP239 usages, such as LOTAR (Long Term Archiving and Retrieval)

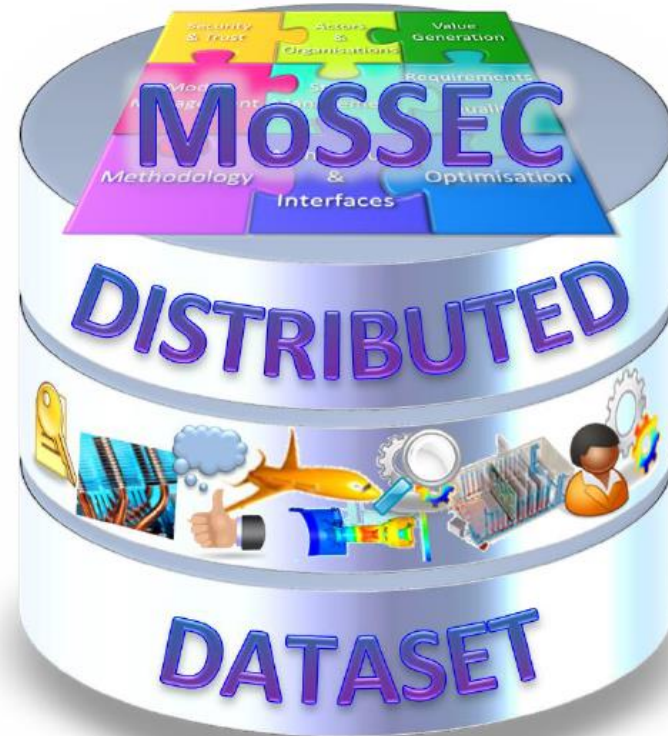- Supports lifecycle model-based enterprises

MoSSEC: More Information

- MoSSEC website
  - mossec.org
  - Overview
  - Resources
  - News
  - Links

- Member website
  - private.mossec.org

- Request to be added to member list
  - Adrian.Murton@airbus.com
    - European Co-Chair
  - Gregory.Pollari@collins.com
    - America Co-Chair
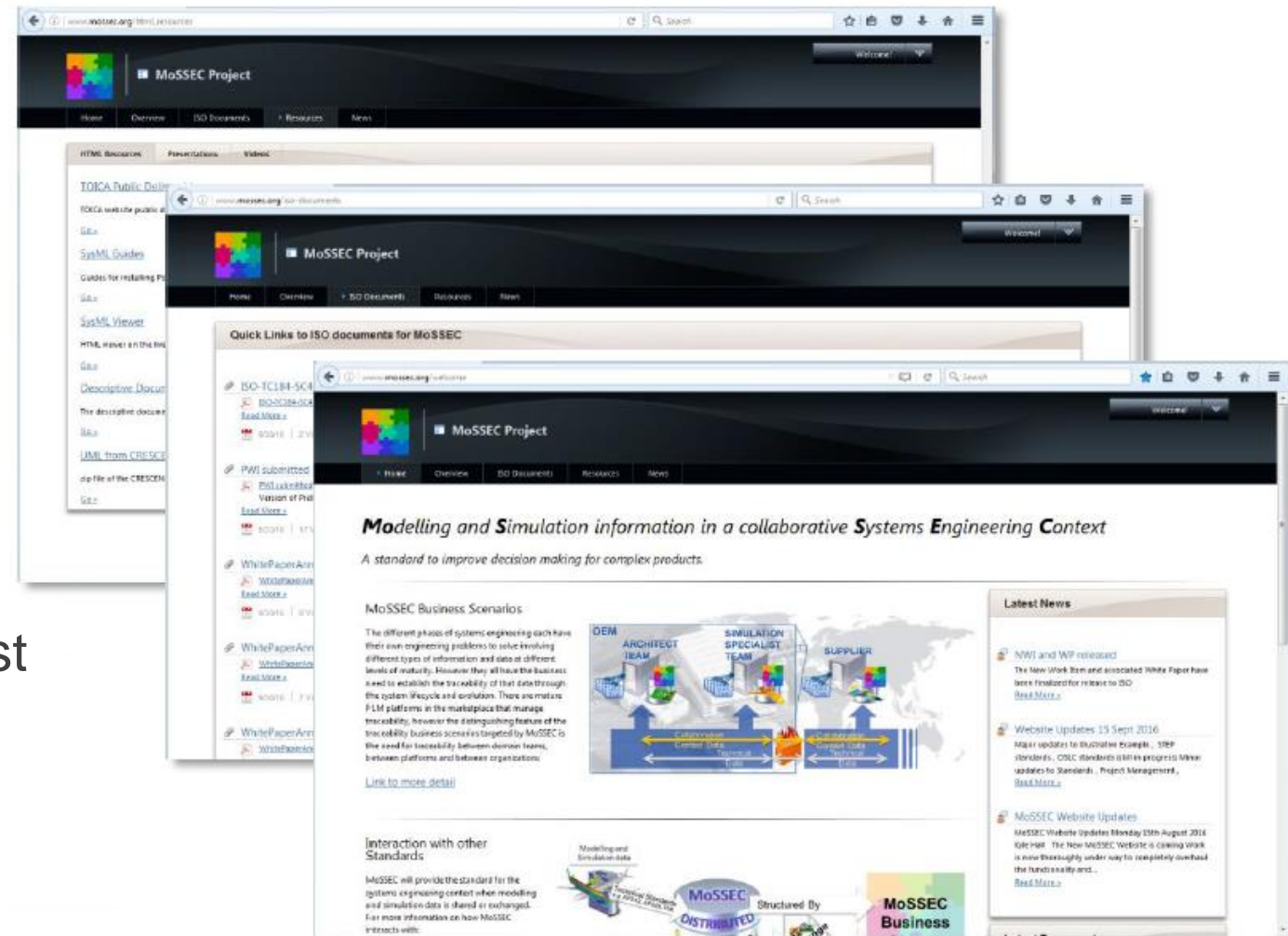
Any Questions?

2019
Annual **INCOSE**
international workshop
Torrance, CA, USA
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