ASSESS Notes from the Front--Community Universal Reference Patterns

- **S*Wrapper**: Model Characterization Pattern
- **S*Trust**: Trusted Model Repository Pattern
- **S*Eco**: Virtual Ecosystem Pattern
Responsible collaborating community organizations

International Council on Systems Engineering (INCOSE)—Model-Based Patterns Working Group:

• Model-based Patterns formalizing knowledge across diverse domains.

ASME Model V&V 50 Subcommittee—Model Life Cycle Working Group:

• Model VVUQ guidelines and standards authoring for establishing and maintaining computational model credibility across life cycles.

V4 Institute (V4I)—a member collaboration program under NCDMM:

• Growing related virtual model capabilities across industry communities of practice.
Virtual model community reference patterns

- **S*Wrapper**: Model Characterization Pattern (describes models)
  - Universal model metadata wrapper for all virtual model types
  - Computational models, system models, others

- **S*Trust**: Trusted Model Repository Pattern (describes repositories)
  - Reference pattern for all trusted repositories of trusted virtual models
  - Federated authoring, execution, application, life cycle management

- **S*Eco**: Virtual Ecosystem Pattern (describes ecosystems)
  - Reference pattern for all life cycle management ecosystem types
  - Processes, models, patterns, datasets, tooling, federations
**S*Wrapper**: Model Characterization Pattern (describes models)

- Helps manage the model’s entire life cycle: planning model stakeholder features, development, VVUQ, exchange, catalog, maintenance;
- Generation of model technical requirements from model features.

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Legend:
- Model Representation
- Model Scope and Content
- Model Credibility
- Model Identity and Focus
- Model Life Cycle Management
- Model Utility

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**Model Representation**

**Model Scope and Content**

**Model Credibility**

**Model Identity and Focus**

**Model Life Cycle Management**

**Model Utility**

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**M**odel **E**ntity **T**ype

**M**odel **S**cope and **C**ontent

**M**odel **C**redibility

**M**odel **I**dentity and **F**ocus

**M**odel **L**ife **C**ycle **M**anagement

**M**odel **U**tility

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**System of Access**

**Pattern-Based**

**Model**

**Requirements**

**Standards**

**Compliance**

**STANDARD**

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**Legend**

- Model Representation
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**Legend:**

- **Model Representation**
- **Model Scope and Content**
- **Model Credibility**
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- **Model Utility**
- **Model Identity and Focus**

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**S*Wrapper: Configurable MCP Feature Groups for Models (Computational Model’s Stakeholder Requirements)**

(See References for details and definitions.)
**S*Trust: Trusted Model Repository Pattern** (describes repositories)

- Neutral configurable pattern for planning, describing, trusting federated toolchains and repositories of trusted models of all types.
- Beginning with configurable generic stakeholder feature pattern.

### Features of Model Repository

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**Notes:**
- *Pattern:* A specific repository configuration may have a contained subset of the features of this pattern.
- *Decomposition:* Any diagram depicting this relationship implies a relationship for the decomposed repository.
- *Effects:* The repository model represented in this pattern may have a corresponding pattern feature for any repository.

**Model Application Transaction Support**

- **Model Credibility Support**:
  - Model Security
  - System Security
  - System Reliability
  - System Reliability

- **Compatibility**:
  - Compatibility
  - System Reliability
  - System Reliability

- **Community of Interest and Teaming Support**:
  - Community of Interest
  - Teaming Support
  - Teaming Support

- **Model Life Cycle Management**:
  - Model Life Cycle Management
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  - Model Life Cycle Management

- **Model-Based Pattern Support**:
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- **Model Application**:
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  - Model Application

- **System Support**:
  - System Support
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- **Configurable Repository Deployment**:
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- **Repository Release Roadmap**:
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**Relevant Features:**

- **Model Application**:
  - Model Security
  - System Security
  - System Reliability
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- **Compatibility**:
  - Compatibility
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*Legend:*
- **Repositories**: Represented as squares.
- **Transactions**: Represented as hexagons.
- **Support**: Represented as diamonds.
- **Roadmaps**: Represented as triangles.

**VU* Model Repository (Digital Commons) Pattern Features**

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**S*Eco**: Universal Virtual Ecosystem Pattern (describes ecosystems)

- **System 1**: Target system of interest, being engineered, managed, operated;
- **System 2**: System of life cycle management of System 1—engineering, et al;
- **System 3**: System of advancing & managing System 2 life cycle (OCM, etc.).
How to get involved


• ASME VV50 Model Life Cycle Working Group: https://cstools.asme.org/csconnect/CommitteePages.cfm?Committee=101978604

• Virtual Verification, Validation, and Visualization Institute (V4I): http://v4i.us/

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812.232.2062
Discussion, questions
References


4. INCOSE MBSE Patterns Working Group, “MBSE Methodology Summary: Pattern-Based Systems Engineering (PBSE), Based On S*MBSE Models”, V1.5.5A: http://www.omgwiki.org/MBSE/doku.php?id=mbse:pbse
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