History of No Magic

1995
No Magic founded

1998
MagicDra w 1.0

2009
Cameo Simulatio n Toolkit

2012
Cameo Systems Moc

2014
Cameo Concept Modeler

2015
Cameo Collabora tor

2016
Teamwor k Cloud

2017
Cameo Enterpr ise Architec ture

2019
Teamwor k Cloud REST API

July 2018
19.0 Release

2018
Acquired by Dassault Systemes

July 2018
TWC OSLC Provider and MagicDra w OSLC Consumer
Systems Engineering Portfolio Alignment

Multi-systems contractual architecture and services

Model Based System Architecture

Multi-physics
Control

3D Digital Mock-up

Electrical Electronics System Architecture

Hardware architecture
Software architecture

Mechanical components
Fluid components
Electrical components

Electronic components

Hardware
Software

No Magic

CATIA

Contracting Authority

Integrator/OEM

Supplier

Upstream studies

Downstream design

End-to-End model continuity

System of Systems UAF

System

Component

No Magic

Electrical components

3D Digital Mock-up

Component

System of Systems UAF

Integrator/OEM

Supplier

Upstream studies

Downstream design

End-to-End model continuity

Electrical components

Software architecture

Hardware architecture
CATIA/No Magic Core Values

1. Standards Based Tools
Implement modeling languages and tool data interfaces using open standards.

2. Model V&V
Provide features that ensure the model is syntactically and semantically correct and ensure the resulting digital data fulfills the requirements for contract deliverables and meets the needs of lateral and downstream engineering processes.

3. Continuity
Provide digital continuity (traceability) from the stakeholder requirements through the architecture to the virtual product design for accurate decision making. Support connectivity and traceability across tools and repositories.

4. Source of truth
Provide the capability to plan, communicate and collaborate among stakeholders on an enduring and authoritative single source of truth.

5. SOI V&V
Provide continuous system of interest (SOI) verification through analytical features and traceability to ensure the design will meet its requirements. Provide SOI validation through features that support traceability from CONOPS through implementation and enable simulation and visualization.

6. Productivity
Improve engineering productivity and efficiency through features that enable re-use, variant management and reduction of modeling effort through automation.
## Alignment of Values with DES Goals

<table>
<thead>
<tr>
<th>Goals</th>
<th>Enabling Core Design Principles</th>
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<tbody>
<tr>
<td>Formalize the Use of Models</td>
<td><img src="image1.png" alt="1. Standards Based Tools" /> <img src="image2.png" alt="2. Model V&amp;V" /> <img src="image3.png" alt="3. Continuity" /> <img src="image4.png" alt="4. Source of truth" /> <img src="image5.png" alt="5. SOI V&amp;V" /></td>
</tr>
<tr>
<td>Provide enduring and authoritative source of truth</td>
<td><img src="image1.png" alt="1. Standards Based Tools" /> <img src="image2.png" alt="2. Model V&amp;V" /> <img src="image3.png" alt="3. Continuity" /> <img src="image4.png" alt="4. Source of truth" /> <img src="image5.png" alt="5. SOI V&amp;V" /> <img src="image6.png" alt="6. Productivity" /></td>
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<tr>
<td>Incorporate technological innovation</td>
<td><img src="image1.png" alt="1. Standards Based Tools" /> <img src="image3.png" alt="3. Continuity" /> <img src="image6.png" alt="6. Productivity" /></td>
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<tr>
<td>Establish a supporting infrastructure and environment</td>
<td><img src="image1.png" alt="1. Standards Based Tools" /> <img src="image2.png" alt="2. Model V&amp;V" /> <img src="image3.png" alt="3. Continuity" /> <img src="image4.png" alt="4. Source of truth" /> <img src="image5.png" alt="5. SOI V&amp;V" /> <img src="image6.png" alt="6. Productivity" /></td>
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<tr>
<td>Transform the culture to adopt engineering across the lifecycle</td>
<td>• Actively involved in OMG, INCOSE, and other standards bodies</td>
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<td></td>
<td>• Provides training to enable the workforce of the future</td>
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The key to success is standardization of interfaces, formats, and languages on top of a foundation of data interoperability*

*Goal 4.2.2 Digital engineering tools
Role Based Access Control for efficient management of user permissions across the enterprise

Cameo DES Capabilities Map

Visualization
- Visualizing requirements in graphical, tabular, matrix or tree structure format
- All diagrams defined in UML, SysML and UPDM/UAF standards are supported

Analysis
- Rigorous requirements traceability to the system model for:
  - coverage analysis
  - impact analysis
  - calculation of metrics
- Automated requirements verification
- Automated tests
- Interface compatibility checks
- Time duration analysis
- Monte Carlo Simulation
- UI prototyping/HI simulation
- Model completeness and correctness

Model Management
- Highly scalable model repository built for large models and distributed teams
- Configuration management including committing, updating, branching and merging
- Track model changes at element level
- Multiple, secure authentication methods
- Role Based Access Control for efficient management of user permissions across the enterprise

Collaboration
- Multiple people can simultaneously work on the same model in parallel
- REST and OSLC services expose model data
- REST allows access perform administrative tasks, manipulate models, and manage the repository
- Integrate with other OSLC enabled tools
- Include non-modellers and other stakeholders via simplified, web-based views for model sharing and review

Interoperability
- OMG XMI support for standards-based model exchange
- Import/Export to/from IBM Rhapsody
- Import/Export to/from Systems Architect
- Exchange with Sparx Enterprise Architect

Workflow
- Models can be easily extended to add status for elements

Customizability
- Define profiles to add new modeling concepts with custom properties, rules, and graphical appearance
- Customize standard diagram palettes or define new diagram types
- Define model checking rules using various scripting languages
- OpenAPI and WebApp Platform to enable custom plugins to the core modelling platform
- Tailor the user interface of the authoring tools to meet the needs and skill-level of the user
Enabling Success

Recommendations for future stakeholder/tool vendor interaction

- Understand stakeholder processes that need to be supported, including a definition of the data behind the process
- Expand stakeholder participation in existing processes and engagements
  - Defining standards
  - Input from user, PMO, and enterprise levels
- Prioritize integration of existing and/or additional disciplines into the digital engineering environment
- Much of the technology is already there to support the goals of the DES initiative - the challenge is one of transformation and implementation
Spreadsheet Based Vendor Specific Implementation

Goals

Formalize the Use of Models
- FMEA data was previously documented in spreadsheets or other ad-hoc methods
- Safety & Risk community came together and developed an OMG specification for a model based implementation

Provide enduring and authoritative source of truth
- Incorporating FMEA into the system architecture modeling tool ensures the data is part of the technical baseline along the system architecture it references

Incorporate technological innovation
- Leverages existing tool capabilities and features of the modeling language

Establish a supporting infrastructure and environment
- Compliant with ISO, IEC and other standards enabling consistent use throughout industry
- Uses existing analytical, exchange, and reporting capabilities of the modeling platform

Transform the culture to adopt engineering across the lifecycle
- Multiple industries collaborated with the tool vendor and the standards body to produce an integrated, digital implementation for broad adoption
- New profile is supported by an ISO standard

DES in Action – A Case Study: Safety and Reliability

Safety and Reliability for UML Request For Proposal

OMG Document: ad/2017-03-05
Letters of Intent due: 15 June 2017
Submissions due: 28 August 2017
Learn More

No Magic Web Site

http://www.nomagic.com

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