Syndeia 3.1 for MBSE

The Next Generation of Model-Based Systems Engineering

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About Intercax

- Born: Georgia Tech spin-off 2008
- Location: Perimeter Center, Atlanta; Pune IT Park, Pune, India
- Focus: Software for MBSE
  - **Syndeia** - PLM/CAD/CAE/ALM Integration with SysML
  - SysML parametric solvers
- Training, consulting, custom apps
  - 3500+ students since 2008
- Customers
  - Gov: NASA, DoD, DoE
  - Commercial: aero, auto, transportation, consumer goods, energy, mfg., healthcare
Agenda

• MBSE, MBE and Syndeia
• What does Syndeia do?
• New Features in Syndeia 3.1
  – Jama Software Interface
  – Stateflow Interface
  – Connection Database
• Future Directions
What is MBSE?
The Engineering Software Universe

- Our customers deal with a diverse, multi-vendor engineering toolset.
- Our customers create and store product/system data in a variety of tools, models and repositories: PLM, ALM, CAD, spreadsheets, databases, SysML models…
The Engineering Software Universe

- The challenge of MBSE is to create a single, unified model extending over all the tools and data repositories.
- This kind of model is called a Graph.
- Syndeia™ creates, manages and displays these Graphs.
Syndeia

Syndeia 1.0 (2014)
Syndeia 2.0 (2015)
Syndeia 3.0 (2016)
Syndeia 3.1 (2017)

System Architecture

Windchill®
Teamcenter®
NX
creo™
DOORS NG
Stateflow
Connection
Database
SIM
DB
ALM
GitHub
JIRA
MySQL
Syndeia
Syndeia 1.0 (2014)
Syndeia 2.0 (2015)
Syndeia 3.0 (2016)
Syndeia 3.1 (2017)

z = f(x, y)
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Connection to PLM Systems and Databases

1. Populate a PLM BoM from SysML
2. Populate a SysML model from PLM
3. Compare & Sync
Connection to 3D CAD models

1. Access a CAD model
2. Generate a CAD file from SysML
3. Generate a block from a CAD part or assembly
4. Compare & Sync
Connection to Simulation

1. Populate a Simulink model from SysML IBD or Activity diagram
2. Populate a SysML model from Simulink
3. Compare & Sync
1. Populate SysML req’ts
2. Populate req’ts tool from SysML
3. Compare & Sync
1. Access latest software file from SysML
Connection to Project Mgmt.

1. Access a JIRA issue from SysML
2. Create a JIRA task structure from SysML
3. Compare & Sync
Visualize and trace connections

1. View all connections
2. View connections around specific element
3. Query a graph database by connection or element type.
Syndeia leverages open standards, open frameworks, and open APIs

- OMG SysML (Systems Modeling Language)
- OSLC
- REST Web Services
- JSON
- JDBC
- ISO STEP 10303
- Apache projects (multiple)
- FMI
- … and others
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Other New Features

• Simulink Synchronization
• API-Based Interface to MATLAB
• Windchill Projects and Libraries
• New Search Capabilities
Syndeia Yesterday (3.0 release and earlier)

- Plug-in for MagicDraw, IBM Rational Rhapsody
- Accessible only from SysML tools
- Connections stored in SysML model
- Visualization and queries from connection database
**Syndeia Today (3.1 release)**

- Plug-in for MagicDraw, IBM Rational Rhapsody
- Accessible only from SysML tools
- Connections stored in Cassandra database/cluster
- Visualization and queries from connection database
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Syndeia Roadmap

Today - Syndeia is a MBSE-centric tool, deployed as a plugin for SysML Modeling tools (MagicDraw, Rhapsody, …)
  • Operates primarily from the SysML tool

Future - Syndeia is an enterprise MBE application
  – REST web services with a backend graph database
  – Advanced query & visualization capabilities
  – Accessible from anywhere in the tool chain (SysML, PLM, ALM, …)
  – Incorporates parametric execution and analysis
  – API for extensible end user applications
**Syndeia 3.2 (Q4 2017)**

- Stand-alone or plug-in client
- API for basic queries
- Customized mapping
- Create inter-model *reference connections* between any two repositories/tools
**Syndeia 3.3 Enterprise Application (Q2 2018)**

- Customized mapping between any tools
- Version Control and User Access Management
- Flexible Graph Queries and Visualizations
- Advanced API for customized applications
- Analysis and report generation
Why Syndeia?

- Works with your tools
- Supports many use cases
- Consistent interface
- A clear vision for MBE
Learn more about Syndeia

• Syndeia site: www.intercax.com/syndeia

• Demo Videos
  – Intro to Syndeia in 3 minutes - https://youtu.be/ RZ4IHDtdN8

...and request an evaluation license

• Download and try Syndeia
  – Request 30-day or longer-term evaluations at: http://intercax.com/products/syndeia/download/
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