Update on the Unified Architecture Framework® (UAF)

Aurelijus Morkevicius, PhD (Dassault Systemes)
Laura Heart (Lockheed Martin)
Matthew Hause (SSI)
• Brief Introduction to UAF
• What’s New in UAF 1.2
• UAF community
• Future Roadmap
• Q/A
Outline

• Brief Introduction to UAF
• What’s New in UAF 1.2
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• Q/A
• UAF is a Standard to develop architectural descriptions in commercial industries, federal governments and military organizations
• UAF is Developed by Object Management Group (OMG)
• It Has many different use cases from Enterprise as a System to Cyber-Systems engineering or enabler for Digital Transformation planning
• The current UAF version is 1.1
• UAF 1.1 DMM is one of the meta-models to be used for creating NAFv4 compliant architectures
• UAF 1.1 is mandated by DISR
• UAF 1.1. was submitted as international ISO standard ISO/IEC 19540. Comments due September
Tool vendors:
• Dassault Systemes
• IBM
• KDM
• MEGA
• Orbus Software
• PTC
• Sparx Systems
• Tom Sawyer

Industry Contributors:
• Airbus
• Aerospace Corporation
• BAE Systems
• Boeing
• DISA
• Lockheed Martin
• MITRE
• Northrop Grumman
• Syntell
• Thales
• INCOSE

Co-chairs
Dr. Aurelijus Morkevicius
Laura E. Hart
# UAF grid

## Model Kinds

<table>
<thead>
<tr>
<th>Domains</th>
<th>Taxonomy</th>
<th>Structure &amp; Connectivity</th>
<th>Behavior</th>
<th>Information</th>
<th>Parameters</th>
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- **View Specifications**

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June 8th 2022

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What’s New in UAF 1.2

• UAF EA Guide
• UAF Grid and Metamodel Improvements
  • Architecture Management Domain
  • Improvements in Strategic and Services Domains (clarify semantics, add new concepts, improve exposition)
  • Support of Value Streams
  • Risk becomes cross-cutting construct
• Alignment with ISO42010
• UAF EA Guide
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## EA Guide

### Taxonomy

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**Where do we start?**

**Which views do we need?**

**How are these views related?**

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Provides a standardized workflow for modeling an Enterprise

- Currently under development with planned release in 2022 with UAF v1.2
  - Preliminary workflow model developed to cover all UAF views
  - Basic 9 steps defined down to 3rd level of decomposition
  - Defines “what” to do for creating the UAF views, but does not identify or define methods or tools relevant for each step (since this is methodology dependent)
- The workflow can be tailored to the particular steps needed for the EA task at hand
EA Guide Steps

Step 0 – Plan and Prepare for Architecting & Assessments
Step 1 – Drivers & Challenges
Step 2 – Enterprise Strategy & Capabilities
Step 3 – Operational Architecture (Logical)
Step 4 – Service Architecture (Black Box)
Step 5 – Resource Architecture (Physical)
Step 6 – Personnel Architecture (Organizational)
Step 7 – Security & Protection (Resilience)
Step 8 – Architecture Portfolio Management
Step 9 – Actual Resource Instantiation
• **Basis for building Architecture Views and Models**
  - Agreement between Upper Enterprise and Lower Enterprise on division of responsibility and dependencies between models, eg...
    - ✓ Department of Defense → Air Force
    - ✓ Corporate Headquarters → Business Unit
    - ✓ Missile Defense Agency → Missile XYZ Program
  - Agreement between Acquisition Agency/Office and Prime Contractor...
  - Agreement between Prime Contractor and Suppliers...
  - Organization of training for Architecture Modeling classes and workshops
  - Assessment of EA modeling capabilities and competencies

• **Basis for creating an Organization’s Modeling Methodology** – Methodology = Process + Methods + Tools + Techniques + Templates...

• **Process Guide instantiated in modeling tools**
  – Navigation Panel, Dashboard, Landing Page, etc for the Model – Model Management WBS and resource planning
What’s New in UAF 1.2

- UAF EA Guide
- UAF Grid and Metamodel Improvements
  - Architecture Management Domain
  - Improvements in Strategic and Services Domains (clarify semantics, add new concepts, improve exposition)
  - Support of Value Streams and updates to the Strategic Phasing
  - Risk becomes cross-cutting construct
- Alignment with ISO42010
Motivation Model Kind

- **Drivers**
  - Demand
  - Competition
  - Laws
  - Regulations
  - People
  - Technology
  - Investment
  - Revenues

- **Enterprise State**
  - Performers
  - Resources
  - Activities
  - Functions

- **Challenges**
- **Opportunities**
- **Capabilities**
- **Risks**
- **Effects**

- **Outcomes**
  - Products
  - Services
  - Revenues
  - Earnings
  - Share Price
  - Market Share
  - Jobs
  - Innovation
• Rename the Domain
• Align the domain with NAF V4
• Provide View Specifications for Architecture Management Domain
• Dictionary is a part of Architecture Management Domain
• Architecture Principles is a new View Specification. Principle is a special kind of a Driver.
• Dictionary is a part of Information Model Kind

• Strategic Information to capture:
  • Knowledge Capital - (Intellectual Property, Personnel & Organizations (e.g., expertise, skills), Policies & Practices (patents, trade secrets, etc), Financial Good Will)
  • Know-How in developing and operating Enterprise Resources - (Platforms, Services, Facilities, Networks, Equipment, Infrastructure)
  • Know-Who and Know-Where (Partners, Suppliers, Distributors, Markets, Users)

• Use of Operational Information and Resources Information clarified
  • Services are using Operational Information
Risk – Cross Cutting Construct
Risk Example

Opportunity → Risk → Goal
• Improved Traceability between Service Layer and Operational and Resource layers.
• Service Specification renamed to Service
• Resource Service introduced to model technical services like web services, etc.
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Annual UAF summit

• Over 700 registrations
• 7 speakers with a keynote from US Space Force
• Presentations available online:
  
  https://events.omg.org/uaf-summit-0321/

UAF community on LinkedIn

Unified Architecture Framework (UAF)

https://www.linkedin.com/groups/8878655/
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UAF 1.2 submission approved by OMG AB in December 2022
  • Improvements in Strategic and Services Domains (clarify semantics, add new concepts, improve exposition)
  • UAF EA Guide (UAF EAG)

UAF 1.3
  • Process Guide for Acquisition (ARM)
  • Address critical comments from ISO if there are any

UAF 2.0
  • Standard Implementation in the SysML v2
UAF 1.2 (submission to OMG AB in November 2021)
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UAF 2.0
- Standard Implementation in the SysML v2
What is the Acquisition Reference Model

ARM is a set of reusable model templates, and guidance used to structure a model-based RFP based on the UAF standard to support data driven decisions beginning with acquisition which can be maintained throughout the complete lifecycle of program.

Use Cases:

- Create Precise RFP
- Respond to RFP
- Evaluate RFP Response
  - Contractor Self Evaluation
  - Government Evaluation
- Maintain Technical Baseline
  - Model evolves overtime and represents the technical baseline
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UAF 2.0
  • Standard Implementation in the SysML v2
• Standard implementation of the current version of UAF is based on SysML 1.x
  • SysML defines model kinds and notation used to create UAF models
• OMG is finalizing SysML v2
  • A different type of language decoupled from UML
  • More formal
  • Models serialized in text-based syntax aka programming language
  • Provides API based on REST API
• UAF WG collaborates with SysML SST
• UAF 2 will have either:
  • implementation in SysML v2 defined
  • DMM extending SysML v2 metamodel
More on UAF

Intro to UAF

https://youtu.be/AWJk_7KtQ0w

Intro to ARM

https://www.brighttalk.com/webcast/12231/394577?

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Thank You!

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