32nd Annual INCOSE international symposium

hybrid event

Detroit, MI, USA
June 25 - 30, 2022

Past, Present, and Future of the Unified Architecture Framework (UAF)

www.incose.org/symp2022

Speaker

Dr. Aurelijus MORKEVIČIUS

CATIA Systems, Industry Process Consulting Director

- PhD, MS, and BS in Software Systems Engineering
- 17 years in Software and Systems Engineering
- UAF co-chairman in OMG, member of INCOSE and NATO ACaT
- Originator of the MagicGrid Framework
- ASEP, OCSMP, OCEB, OCUP certified professional

Outline

- What is UAF? (Past)
- What's New in UAF 1.2 (Present)
- Future Roadmap (Future)

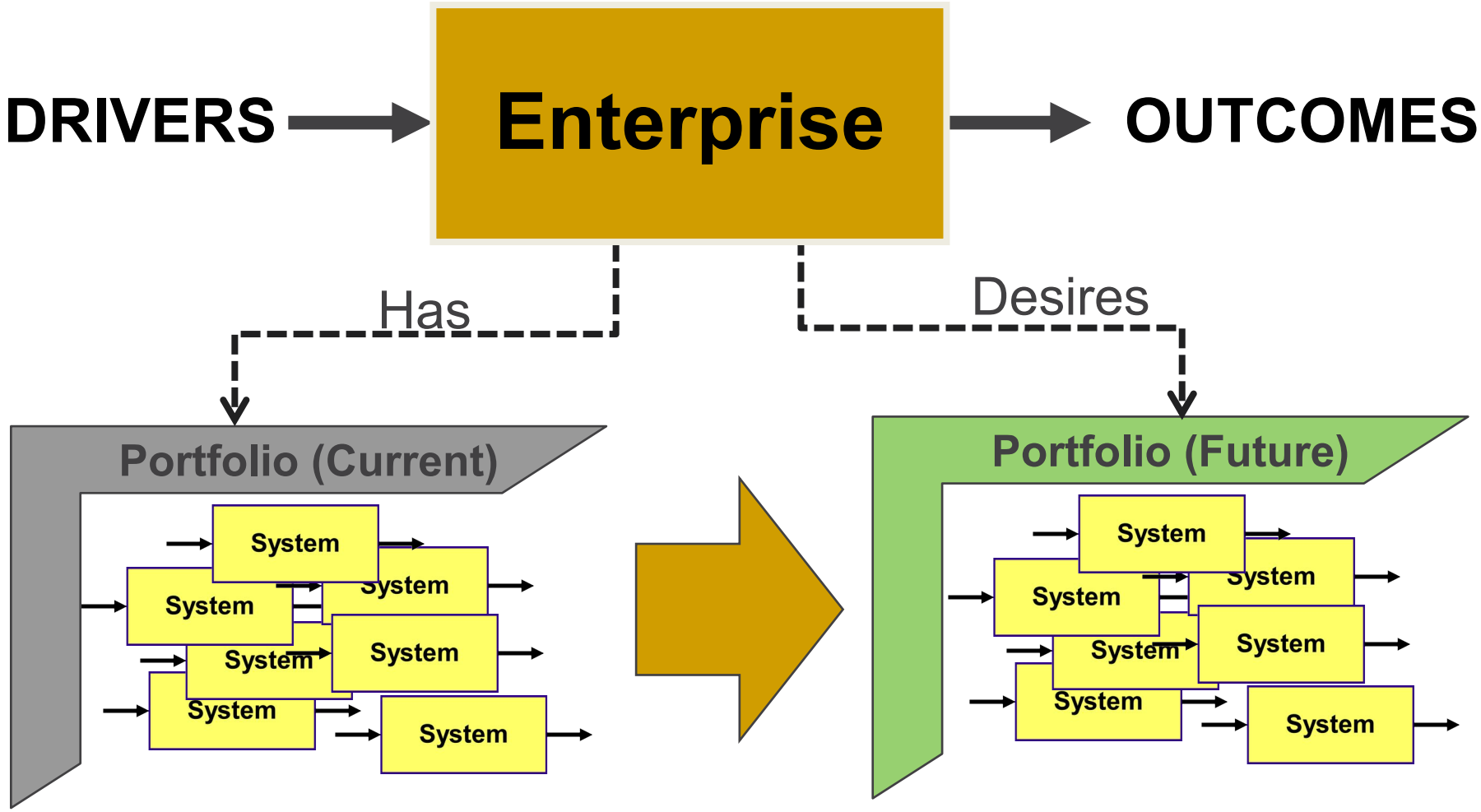
Past

What is UAF?

UAF is a Standard…

- To develop architectural descriptions
  - in **commercial industries**, **federal governments** and **military organizations**
  - compatible with **DoDAF** and **NAF**
- Has many different use cases from **Enterprise as a System** to **SoS** and **Cyber-Systems engineering** or enabler for **Digital Transformation planning**
- Developed by Object Management Group (OMG) with the leadership from Dassault Systemes and Lockheed Martin
- Is an international ISO standard ***ISO/IEC 19540:1*** *and* ***ISO/IEC 19540:2***
- Current version of UAF specification is 1.1 https://www.omg.org/spec/UAF/1.1/About-UAF/
- UAF version 1.2 is expected to be officially published in the coming month

UAF Purpose


DRIVERS
Enterprise
OUTCOMES
Has
Desires
Portfolio (Current)
System
System
System
System
System
System
Portfolio (Future)
System
System
System
System
System
System

Enterprise versus System

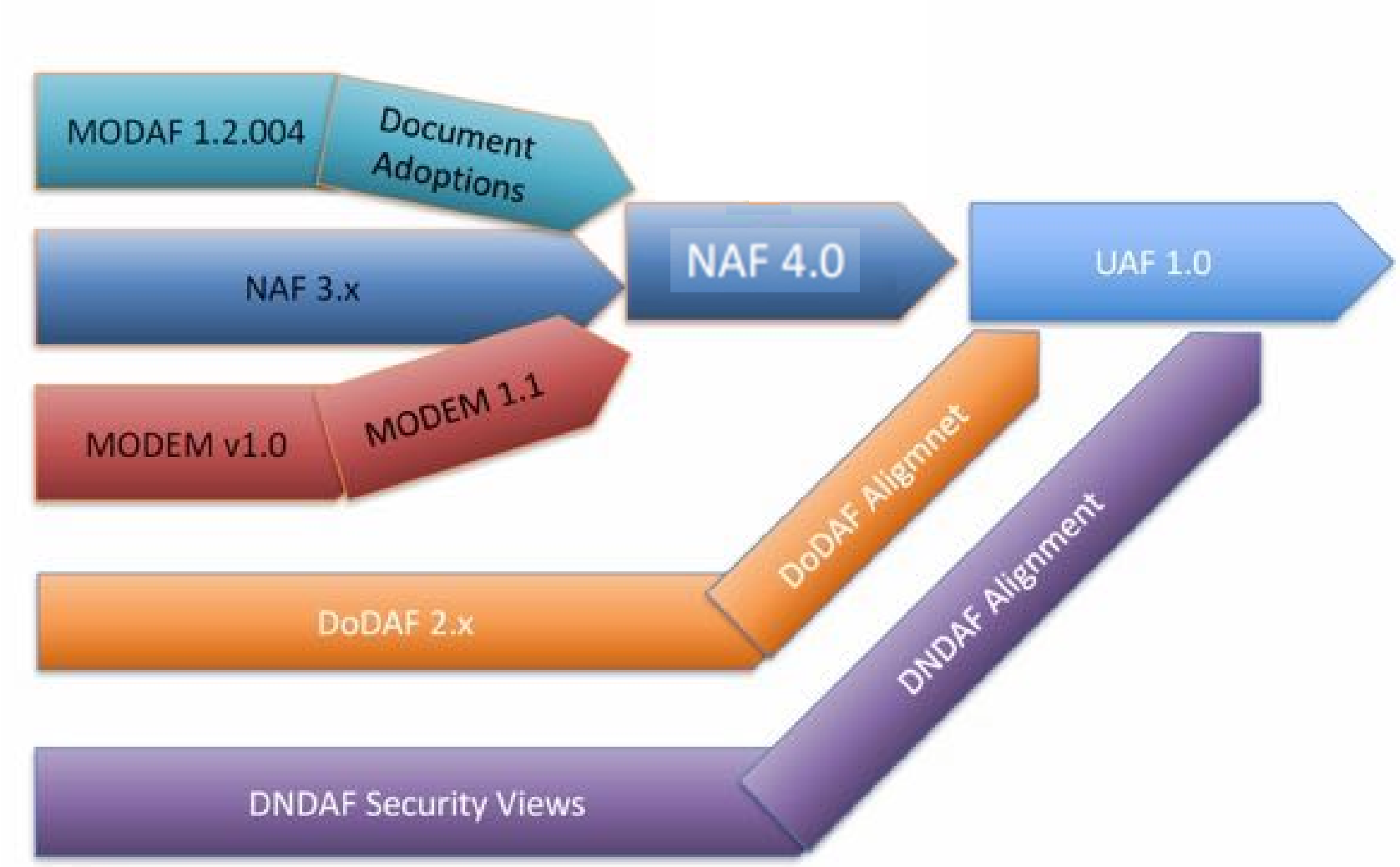
System Architecture is Like Blueprints for a Building

Outputs for a System tend to be the same over its lifetime. Results for a system are more readily predicted.

Enterprise Architecture is More Like Urban Planning

Outcomes for an Enterprise are very complex and are shifting over time. Usually a “sequence” of outcomes is laid out in a roadmap. The Enterprise can even change its own objectives!

Prehistory


MODAF 1.2.004
Document Adoptions
NAF 3.x
NAF 4.0
UAF 1.0
MODEM v1.0
MODEM 1.1
DoDAF Alignmnet
DoDAF 2.x
DNDAF Alignment
DNDAF Security Views

Who is behind?

Tool vendors:

- Dassault Systemes
- IBM
- KDM
- MEGA
- Orbus Software
- PTC
- Sparx Systems
- Tom Sawyer

Industry/ Government Contributors:

- Airbus
- Aerospace Corporation
- BAE Systems
- Boeing
- Department of Navy (US)
- Lockheed Martin
- MITRE
- Northrop Grumman
- Rolls-Royce Corporation
- Syntell
- Thales
- INCOSE and GfSE

Leadership:

Laura E. Hart

Dr. Aurelijus Morkevicius

Matthew Hause

UAF specification at a glance

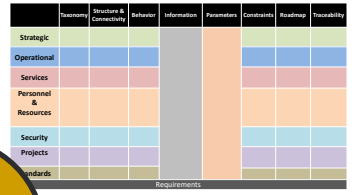
UAF
OMG UNIFIED ARCHITECTURE FRAMEWORK ™

Specification

EA guide (EAG)

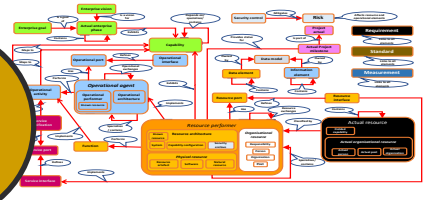
4

View specifications organized in viewpoints and aspects (Grid)



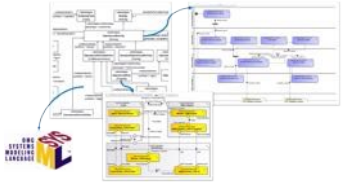
1

Domain MetaModel (DMM)



2

Modeling Language based on SysML (ML)



3

UAF specification at a glance

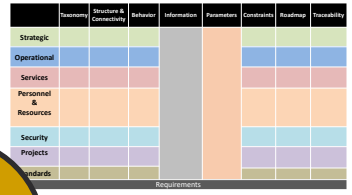
UAF
OMG UNIFIED ARCHITECTURE FRAMEWORK ™

Specification

EA guide (EAG)

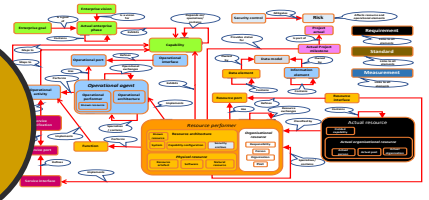
4

View specifications organized in viewpoints and aspects (Grid)



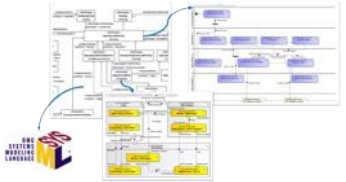
1

Domain MetaModel (DMM)



2

Modeling Language based on SysML (ML)



3

UAF Grid

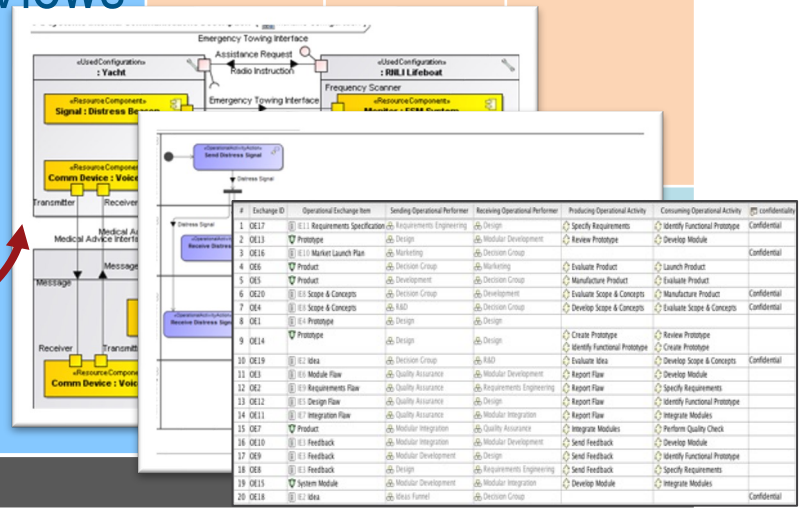
Aspects

Viewpoints

	Taxonomy	Structure & Connectivity	Behavior	Information	Parameters	Constraints	Roadmap	Traceability
Strategic								
Operational								
Services								
Personnel & Resources								
Security								
Projects								
Standards								
Requirements								

View Specifications

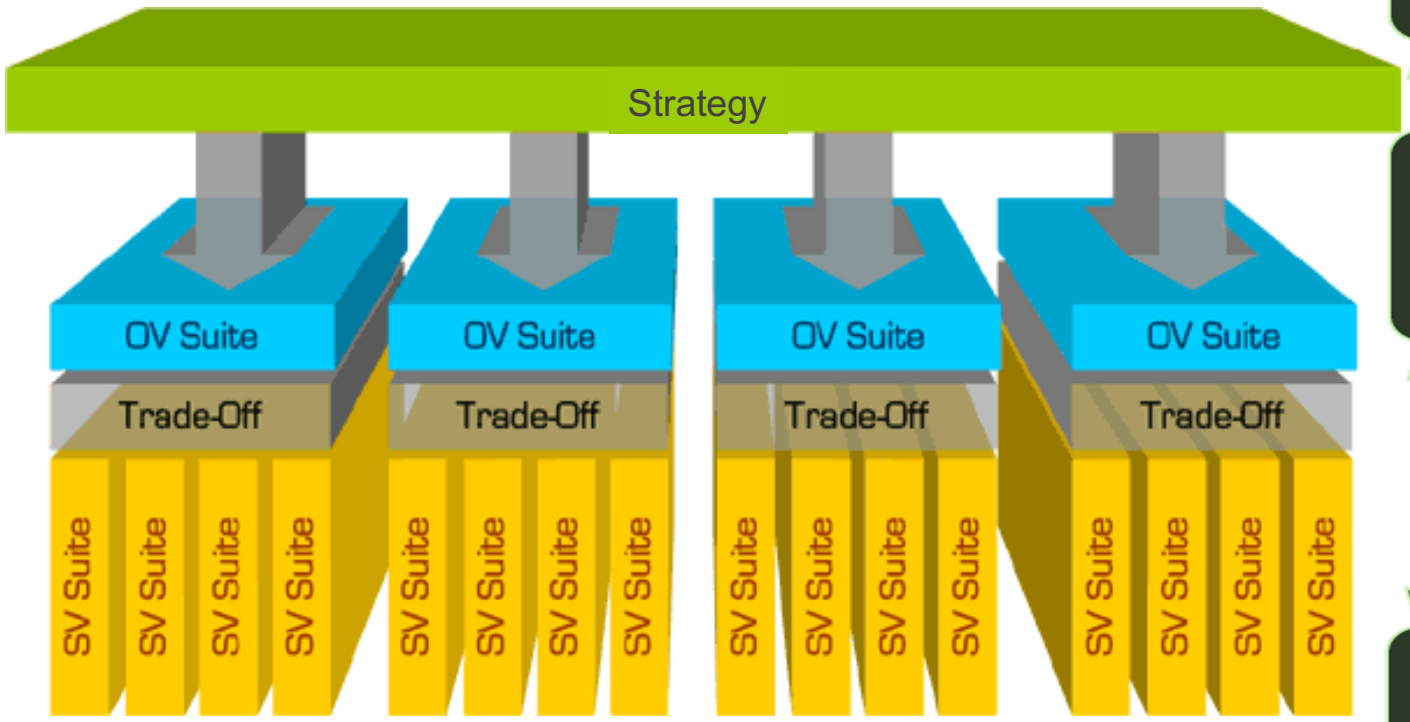
Views



1

UAF OMG UNIFIED ARCHITECTURE FRAMEWORK	Motivation Mv	Taxonomy Tx	Structure Sr	Connectivity Cn	Processes Pr	States St	Sequences Sq	Information[c] If	Parameters[d] Pm	Constraints Ct	Roadmap Rm	Traceability Tr
Architecture Management[a] Am	Architecture Principles Am-Mv	Architecture Extensions Am-Tx[e]	Architecture Views Am-Sr	Architecture References Am-Cn	Architecture Development Method Am-Pr	Architecture Status Am-St		Dictionary Am-If	Architecture Parameters Am-Pm	Architecture Constraints Am-Ct	Architecture Roadmap Am-Rm	Architecture Traceability Am-Tr
Summary & Overview Sm-Ov												
Strategic St	Strategic Motivation St-Mv	Strategic Taxonomy St-Tx	Strategic Structure St-Sr	Strategic Connectivity St-Cn	Strategic Processes St-Pr	Strategic States St-St		Strategic Information St-If	Environment En-Pm-E and Measurements Me-Pm-M and Risks Rk-Pm-R	Strategic Constraints St-Ct	Strategic Deployment, St-Rm-D Strategic Phasing St-Rm-P	Strategic Traceability St-Tr
Operational Op	Requirements Rq-Mv	Operational Taxonomy Op-Tx	Operational Structure Op-Sr	Operational Connectivity Op-Cn	Operational Processes Op-Pr	Operational States Op-St	Operational Sequences Op-Sq	Operational Information Op-If		Operational Constraints Op-Ct		Operational Traceability Op-Tr
Services Sv		Services Taxonomy Sv-Tx	Services Structure Sv-Sr	Services Connectivity Sv-Cn	Services Processes Sv-Pr	Services States Sv-St	Services Sequences Sv-Sq			Services Constraints Sv-Ct	Services Roadmap Sv-Rm	Services Traceability Sv-Tr
Personnel Ps		Personnel Taxonomy Ps-Tx	Personnel Structure Ps-Sr	Personnel Connectivity Ps-Cn	Personnel Processes Ps-Pr	Personnel States Ps-St	Personnel Sequences Ps-Sq	Resources Information Rs-If		Competence, Drivers, Performance Ps-Ct	Personnel Availability Ps-Rm-A Personnel Evolution PS-Rm-E Personnel Forecast Ps-Rm-F	Personnel Traceability Ps-Tr
Resources Rs		Resources Taxonomy Rs-Tx	Resources Structure Rs-Sr	Resources Connectivity Rs-Cn	Resources Processes Rs-Pr	Resources States Rs-St	Resources Sequences Rs-Sq			Resources Constraints Rs-Ct	Resources evolution Rs-Rm-E Resources forecast Rs-Rm-F	Resources Traceability Rs-Tr
Security Sc	Security Controls Sc-Mv	Security Taxonomy Sc-Tx	Security Structure Sc-Sr	Security Connectivity Sc-Cn	Security Processes Sc-Pr					Security Constraints Sc-Ct		Security Traceability Sc-Tr
Projects Pj		Projects Taxonomy Pj-Tx	Projects Structure Pj-Sr	Projects Connectivity Pj-Cn	Projects Processes Pj-Pr						Projects Roadmap Pj-Rm	Projects Traceability Pj-Tr
Standards Sd		Standards Taxonomy Sd-Tx	Standards Structure Sd-Sr								Standards Roadmap Sd-Rm	Standards Traceability Sd-Tr
Actual Resources Ar			Actual Resources Structure, Ar-Sr	Actual Resources Connectivity, Ar-Cn	Simulation[b]					Parametric Execution/ Evaluation[b]		

Viewpoint Interrelationships



Strategy

Operational Scenarios

Resource Configurations

UAF specification at a glance

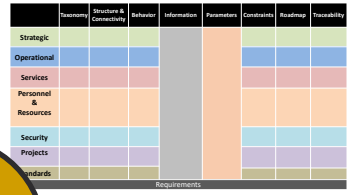
UAF
OMG UNIFIED ARCHITECTURE FRAMEWORK ™

Specification

EA guide (EAG)

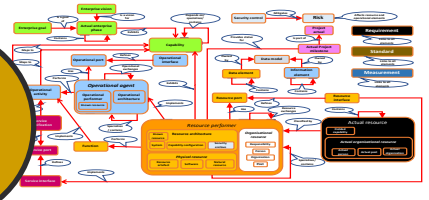
4

View specifications organized in viewpoints and aspects (Grid)



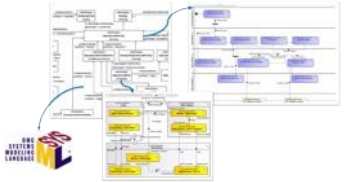
1

Domain MetaModel (DMM)



2

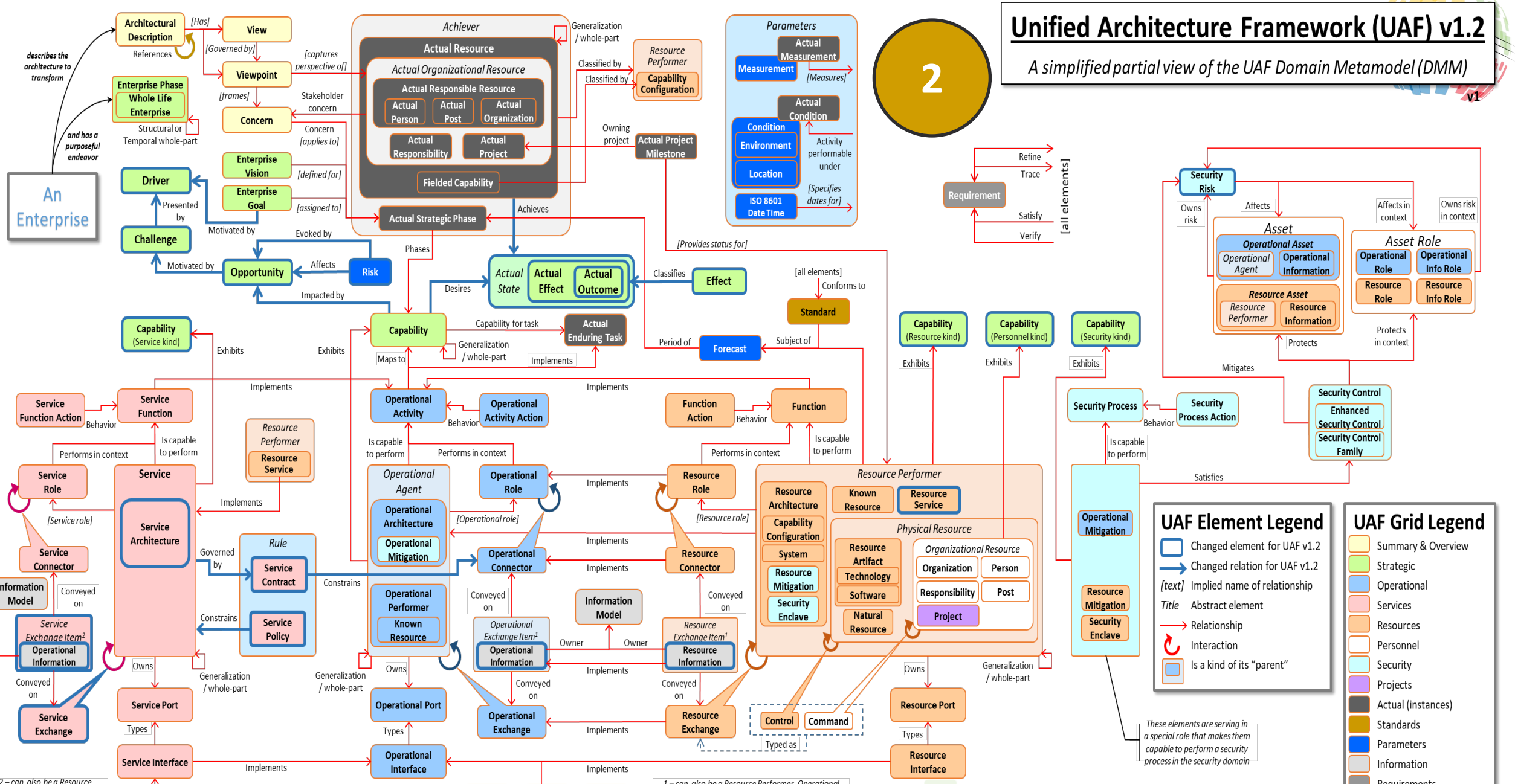
Modeling Language based on SysML (ML)



3

Unified Architecture Framework (UAF) v1.2

A simplified partial view of the UAF Domain Metamodel (DMM)



UAF specification at a glance

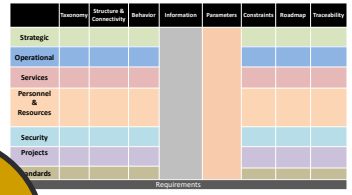
UAF
OMG UNIFIED ARCHITECTURE FRAMEWORK ™

Specification

EA guide (EAG)

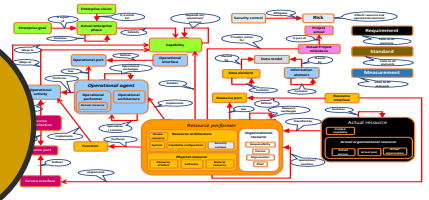
4

View specifications organized in viewpoints and aspects (Grid)



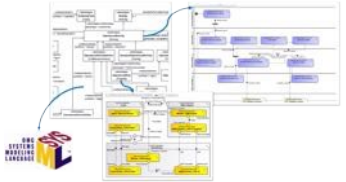
1

Domain MetaModel (DMM)



2

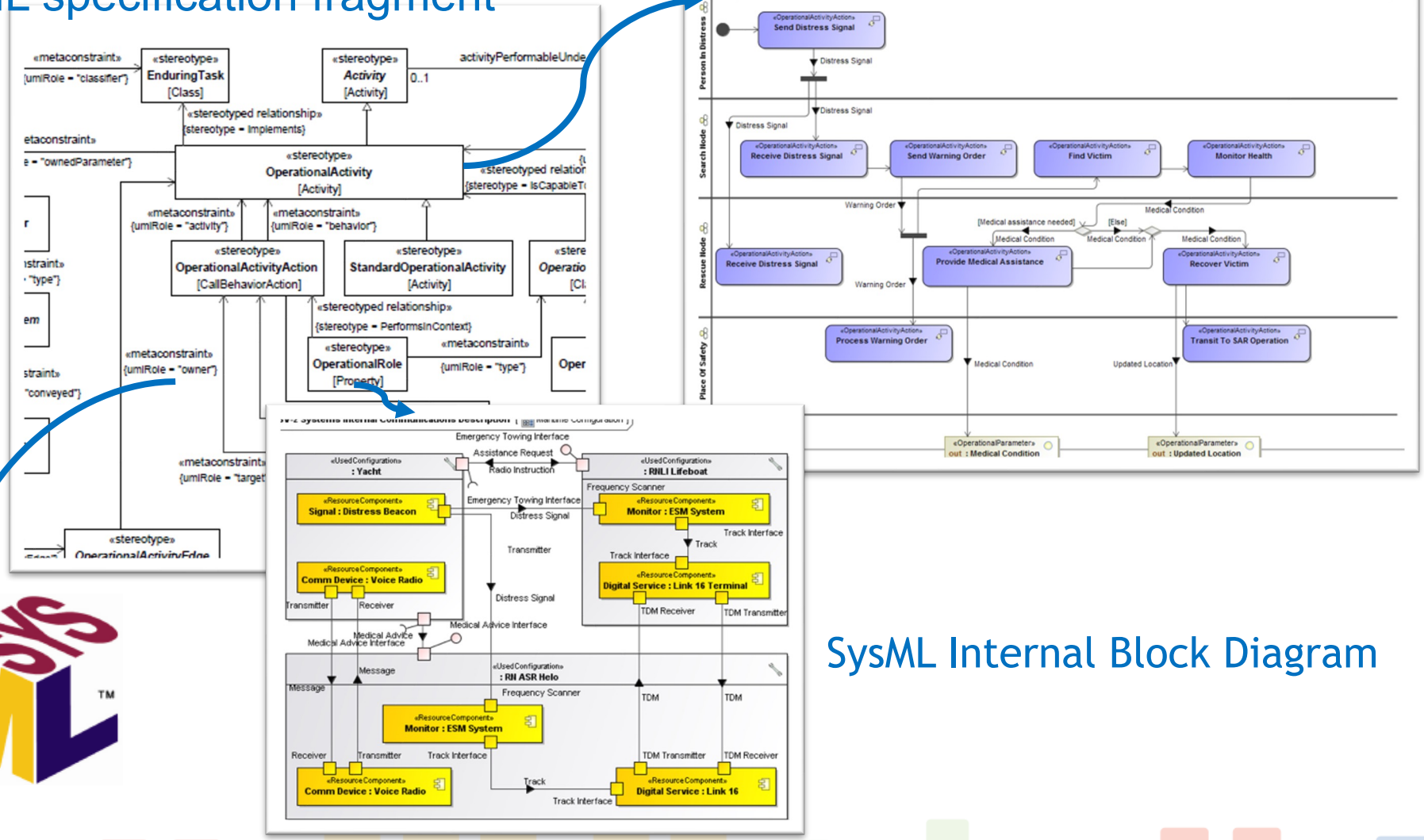
Modeling Language based on SysML (ML)



3

UAF ML – Implementation in SysML

UAF ML specification fragment

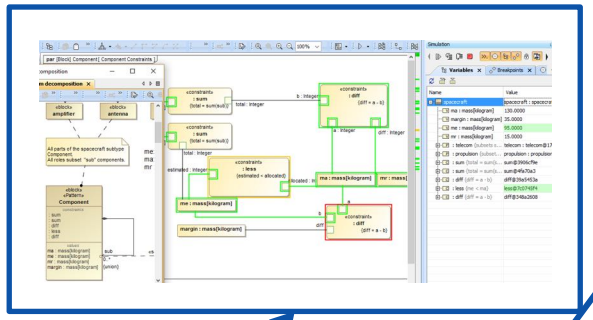


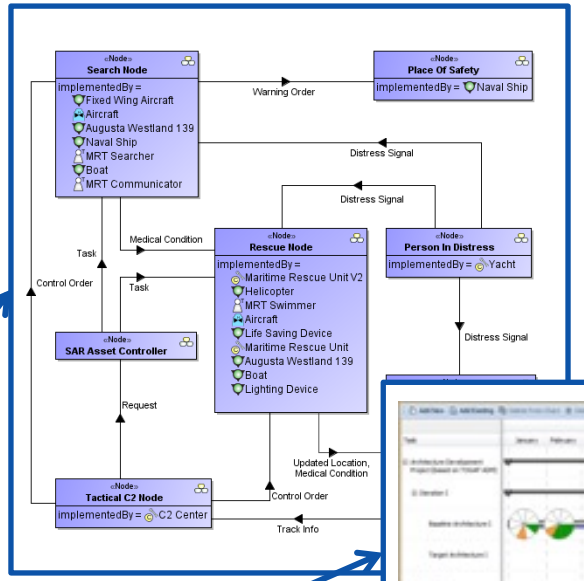
Extends

SysML Internal Block Diagram

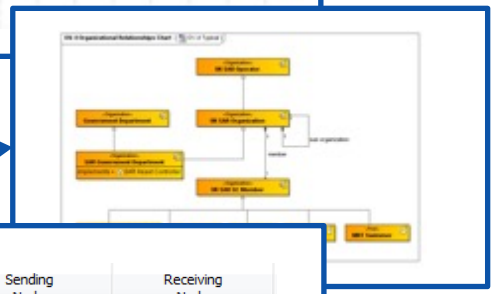
Architecture Model

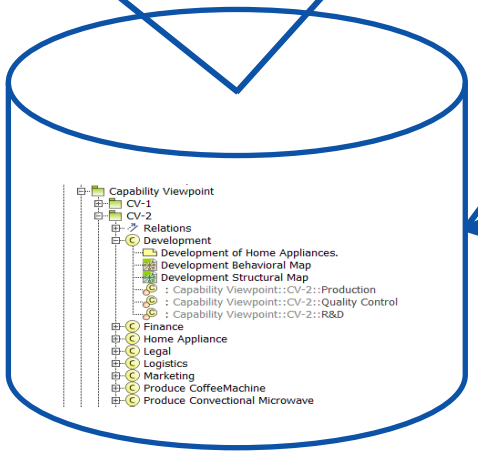
ANALYSIS & SIMULATION





ARCHITECTURE VIEWS





ARCHITECTURE MODEL

#	Exchange ID	Needline ID	Operational Exchange Item	Sending Node	Receiving Node
1	IE7	7	Control Order	Tactical C2 Node	Search Node
2	IE8	8	Request	Tactical C2 Node	SAR Asset Controller
3	IE5	5	Control Order	Tactical C2 Node	Rescue Node
4	IE1	1	Warning Order	Search Node	Place Of Safety
5	IE10	10	Task	SAR Asset Controller	Search Node
6	IE9	9	Task	SAR Asset Controller	Rescue Node
7	IE2	2	Medical Condition	Search Node	Rescue Node
8	IE11	11	Distress Signal	Person In Distress	Search Node
9	IE3	3	Distress Signal	Person In Distress	Rescue Node
10	IE4	4	Distress Signal	Person In Distress	Monitoring Node
11	IE6	6	Track Info	Monitoring Node	Tactical C2 Node

Transitioning from System of Systems to System Architecture

Enterprise Architecture

UAF OMG UNIFIED ARCHITECTURE FRAMEWORK ™

Capabilities

Capability Requirements ↓ ↑ Verification

Operational Scenarios

Operational Requirements ↓ ↑ Trade-offs

System of Systems Architecture

Business & Mission Analysis

UAF	Taxonomy Tx	Structure Sr	Connectivity Cn	Processes Pr	States St	Interaction Scenarios Is	Information If	Parameters Pm	Constraints Ct	Roadmap Rm	Traceability Tr
Metadata Md	Metadata Taxonomy Md-Tx	Architecture Viewpoints [a] Md-Sr	Metadata Connectivity Md-Cn	Metadata Processes [a] Md-Pr	-	-	Conceptual Data Model, Logical Data Model, Physical Data Model	Environment Pm-En; Measurements Pm-Me	Metadata Constraints [a] Md-Ct		Metadata Traceability Md-Tr
Strategic St	Strategic Taxonomy St-Tx	Strategic Structure St-Sr	Strategic Connectivity St-Cn	-	Strategic States St-St	-			Strategic Constraints St-Ct	Strategic Deployment, St-Rm; Strategic Phasing St-Rm	Strategic Traceability St-Tr
Operational Op	Operational Taxonomy Op-Tx	Operational Structure Op-Sr	Operational Connectivity Op-Cn	Operational Processes Op-Pr	Operational States Op-St	Operational Interaction Scenarios Op-Is			Operational Constraints Op-Ct	-	Operational Traceability Op-Tr
Services Sv	Service Taxonomy Sv-Tx	Service Structure Sv-Sr	Service Connectivity Sv-Cn	Service Processes Sv-Pr	Service States Sv-St	Service Interaction Scenarios Sv-Is			Service Constraints Sv-Ct	Service Roadmap Sv-Rm	Service Traceability Sv-Tr
Personnel Pr	Personnel Taxonomy Pr-Tx	Personnel Structure Pr-Sr	Personnel Connectivity Pr-Cn	Personnel Processes Pr-Pr	Personnel States Pr-St	Personnel Interaction Scenarios Pr-Is			Competence, Drivers, Performance Pr-Ct	Personnel Availability, Personnel Evolution, Personnel Forecast Pr-Rm	Personnel Traceability Pr-Tr
Resources Rs	Resource Taxonomy Rs-Tx	Resource Structure Rs-Sr	Resource Connectivity Rs-Cn	Resource Processes Rs-Pr	Resource States Rs-St	Resource Interaction Scenarios Rs-Is			Resource Constraints Rs-Ct	Resource evolution, Resource forecast Rs-Rm	Resource Traceability Rs-Tr
Security Sc	Security Taxonomy Sc-Tx	Security Structure Sc-Sr	Security Connectivity Sc-Cn	Security Processes Sc-Pr	-	-			Security Constraints Sc-Ct	-	Security Traceability Sc-Tr
Projects Pj	Project Taxonomy Pj-Tx	Project Structure Pj-Sr	Project Connectivity Pj-Cn	Project Processes Pj-Pr	-	-			-	Project Roadmap Pj-Rm	Project Traceability Pj-Tr
Standards Sd	Standard Taxonomy Sd-Tx	Standards Structure Sd-Sr	-	-	-	-			-	Standards Roadmap Sd-Rm	Standards Traceability Sd-Tr
Actuals Resources Ar		Actual Resources Structure, Ar-Sr	Actual Resources Connectivity, Ar-Cn	Simulation [b]					Parametric Execution/ Evaluation [b]	-	-
Dictionary * Dc											
Summary & Overview Sm-Ov											
Requirements Req											

SoS Specification ↓

System 1 Architecture

OMG SYSTEMS MODELING LANGUAGE SysML ™

Domains	Pillars: Requirements	Behavior	Structure	Parameters	Safety
Problem	Stakeholder Needs and Requirements Definition (Typical Roles: Requirements Engineer)	Operational concept development (Typical Roles: System Architect, Function Leader, Systems Engineer...)			
Solution	System Requirements Definition (Typical Roles: System Architect, Function Leader, Systems Engineer...)	High-level Solution Design Definition (Typical roles: Solution Architect, Electrical Electronics Architect, Geometrical Architect,...)	System Architecture Definition (Typical Roles: System Architect, Function Leader, Systems Engineer...)	Detailed Solution Design Definition (Typical roles: Solution Architect, Electrical Electronics Architect, Geometrical Architect,...)	
Implementation	Physical Requirements Definition (Typical Roles: Solution Architect)		Implementation (Typical roles: Mechanical Engineer, Electrical Engineer, Fluid Engineer, Software Engineer...)		

System 2 Architecture

OMG SYSTEMS MODELING LANGUAGE SysML ™

Domains	Pillars: Requirements	Behavior	Structure	Parameters	Safety
Problem	Stakeholder Needs and Requirements Definition (Typical Roles: Requirements Engineer)	Operational concept development (Typical Roles: System Architect, Function Leader, Systems Engineer...)			
Solution	System Requirements Definition (Typical Roles: System Architect, Function Leader, Systems Engineer...)	High-level Solution Design Definition (Typical roles: Solution Architect, Electrical Electronics Architect, Geometrical Architect,...)	System Architecture Definition (Typical Roles: System Architect, Function Leader, Systems Engineer...)	Detailed Solution Design Definition (Typical roles: Solution Architect, Electrical Electronics Architect, Geometrical Architect,...)	
Implementation	Physical Requirements Definition (Typical Roles: Solution Architect)		Implementation (Typical roles: Mechanical Engineer, Electrical Engineer, Fluid Engineer, Software Engineer...)		

...

System .. N Architecture

OMG SYSTEMS MODELING LANGUAGE SysML ™

Domains	Pillars: Requirements	Behavior	Structure	Parameters	Safety
Problem	Stakeholder Needs and Requirements Definition (Typical Roles: Requirements Engineer)	Operational concept development (Typical Roles: System Architect, Function Leader, Systems Engineer...)			
Solution	System Requirements Definition (Typical Roles: System Architect, Function Leader, Systems Engineer...)	High-level Solution Design Definition (Typical roles: Solution Architect, Electrical Electronics Architect, Geometrical Architect,...)	System Architecture Definition (Typical Roles: System Architect, Function Leader, Systems Engineer...)	Detailed Solution Design Definition (Typical roles: Solution Architect, Electrical Electronics Architect, Geometrical Architect,...)	
Implementation	Physical Requirements Definition (Typical Roles: Solution Architect)		Implementation (Typical roles: Mechanical Engineer, Electrical Engineer, Fluid Engineer, Software Engineer...)		

UAF specification at a glance

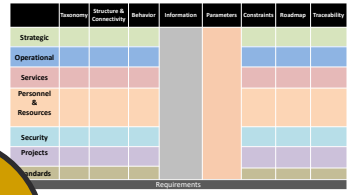
UAF
OMG UNIFIED ARCHITECTURE FRAMEWORK ™

Specification

EA guide (EAG)

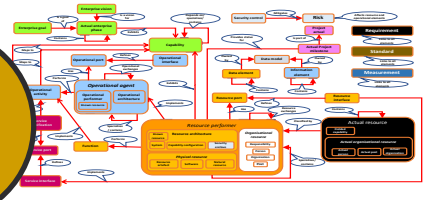
4

View specifications organized in viewpoints and aspects (Grid)



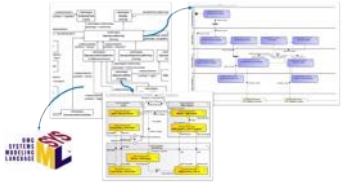
1

Domain MetaModel (DMM)



2

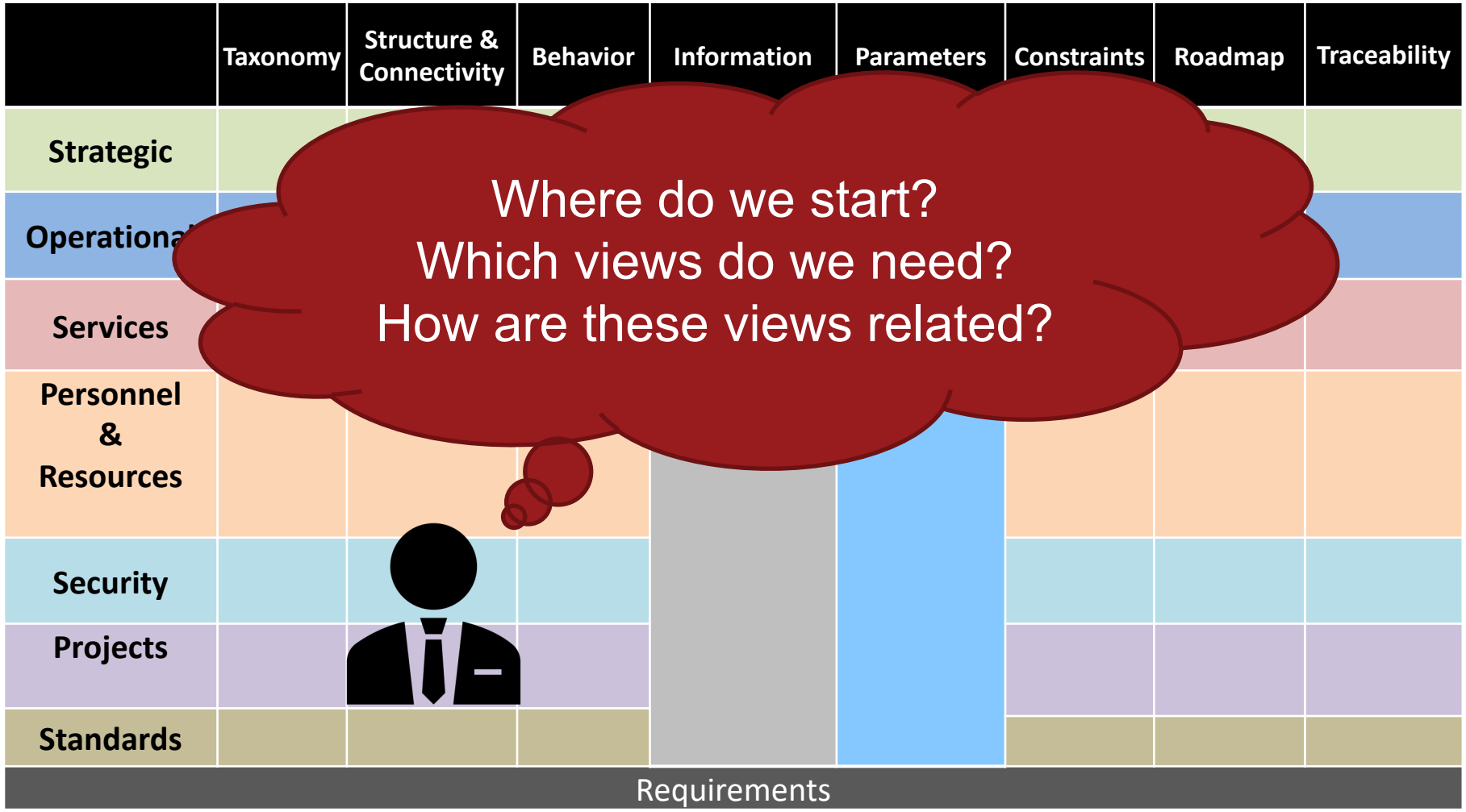
Modeling Language based on SysML (ML)



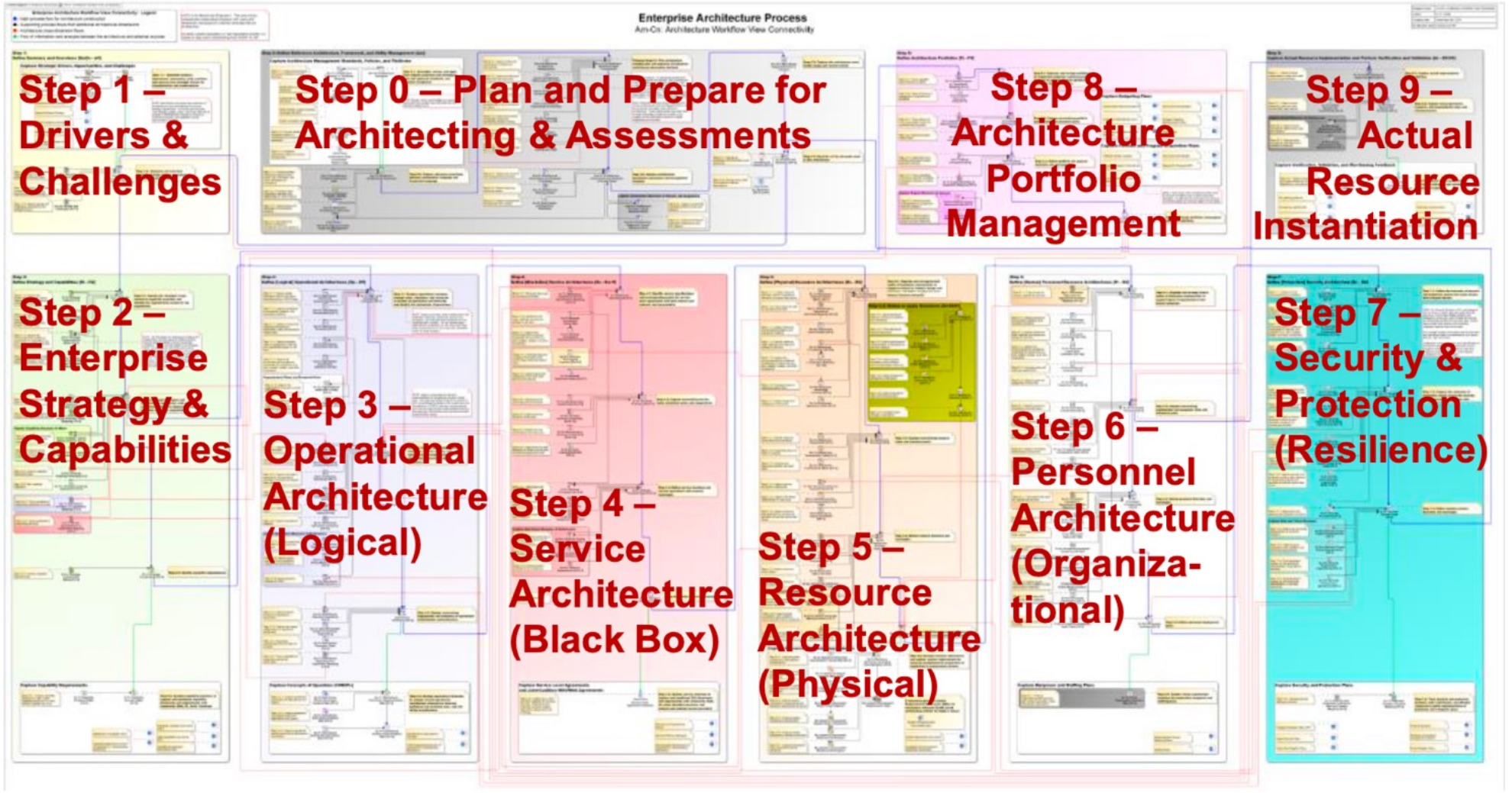
3

EA Guide

4


Taxonomy
Structure & Connectivity
Behavior
Information
Parameters
Constraints
Roadmap
Traceability
Strategic
Operational
Services
Personnel & Resources
Security
Projects
Standards
Requirements
Where do we start?
Which views do we need?
How are these views related?

EA Guide Steps



Who Uses UAF?

1. Aerospace Corp.
2. Airbus
3. BAE Systems
4. Boeing
5. Bundeswehr
6. Deloitte
7. DISA
8. DGA
9. Leonardo
10. Lockheed Martin
11. MITRE
12. NATO
13. Northrop Grumman
14. Norwegian Air Traffic Control
15. Raytheon
16. Rolls Royce
17. SAAB
18. Swedish Defense Materiel Administration
19. US Airforce
20. US Navy
21. US Army
22. Vencore
23. Volvo Construction Equipment

- selected list of users

The role of UAF in the context of NATO and DoD

DoD positioning

- UAF ML is mandated in Defense Information Standards Registry (DISR) on the November of 2021
- MOSA
  - The Department of Defense's (DoD) modular open systems approach (MOSA) is to design systems with **highly cohesive, loosely coupled**, and severable modules that can be competed separately and acquired from independent vendors.
  - This approach allows the Department to acquire warfighting capabilities, including **systems, subsystems, software components, and services**, with more flexibility and competition.
  - MOSA implies a structure in which system interfaces share common, **widely accepted standards**, with which **conformance can be verified**.
  - This is part of a **comprehensive systems engineering strategy**.
  - The combination of UAF and SysML provide a means of supporting MOSA architectures.

Overlay of DoDAF Views onto the UAF Grid

UAF	Motivation Mv	Taxonomy Tx	Structure Sr	Connectivity Cn	Processes Pr	States St	Sequences Sq	Information If	Parameters Pm	Constraints Ct	Roadmap Rm	Traceability Tr
Architecture Management Am	-	-	-	-	-	-		AV-2	-	-	-	-
Summary & Overview AV-1												
Strategic St	-	CV-2		CV-4	CV-1	-		DIV-1	SvcV -7	-	CV-3 CV-5	-
Operational Op	-	OV-1 OV-2		OV-3	OV-5a OV-5b	OV-6b	OV-6c	DIV-2		OV-6a		CV-6
Services Sv		SvcV-1	SvcV-1 SvcV-2	SvcV-3a SvcV-3b SvcV-6	SvcV-4	SvcV-10b	SvcV-10c			SvcV-10a	SvcV-8 SvcV-9	SvcV-5 CV-7
Personnel Ps		OV-4		SV-3 SV-6	SV-4	SV-10b	SV-10c	DIV-3		OV-4 SV-10a SV-7	SV-8 SV-9	SV-5a SV-5b
Resources Rs		SV-1 SV-2		SV-3 SV-6	SV-4	SV-10b	SV-10c		SV-7	SV-10a	SV-8 SV-9	SV-5a SV-5b
Security Sc	-	-	-	-	-					-		-
Projects Pj		PV-1		PV-2	-						PV-2	PV-3
Standards Sd		StdV-1									StdV-2	StdV-1
Actual Resources Ar			OV-4	OV-4 SV-1 SV-2	-					-		

NATO Architecture Framework V4

Chapter 4

3 UNIFIED ARCHITECTURE FRAMEWORK® (UAF) DOMAIN META-MODEL (DMM)®

3.1 The Unified Architecture Framework (UAF) Domain Meta-model (DMM) is an open and non-implementation specific meta-model developed by the Object Management Group® to describe various stakeholder concerns, such as security or information, associated with a system through a set of predefined viewpoints and associated views, mapped to the corresponding view in NAFv4.

3.2 Since scope and expressiveness of the UAF DMM exceed the current needs of NAFv4 and some of the mapped viewpoints differ between NAFv4 and UAF, the use of UAF in NAFv4 is based on a subset of the UAF DMM described in a separate guideline document.

3.3 Architectures implemented using the full UAF DMM are fully compliant to NAFv4 when covering the corresponding viewpoints. To ensure further compliance, the additional parts of the UAF DMM must first be used if extending the UAF DMM based NAFv4 metamodel.

UAF Modelling Guidelines for NAF are publicly available to download from:
https://www.nato.int/cps/en/natohq/topics_157575.htm

Present

What's New in UAF 1.2?

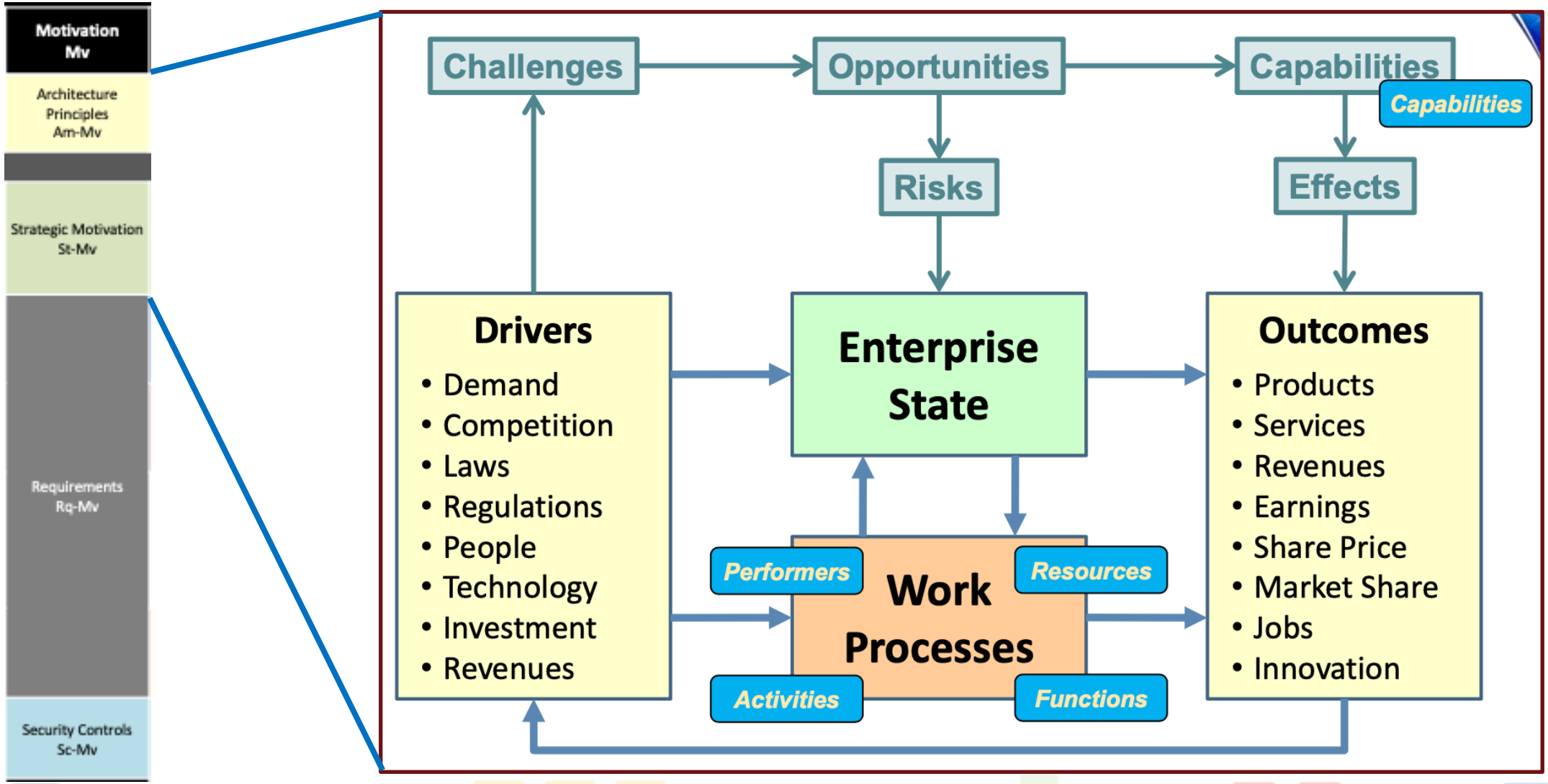
What's new in UAF 1.2

- UAF EA Guide
- UAF Grid, Metamodel, and Modeling Language 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

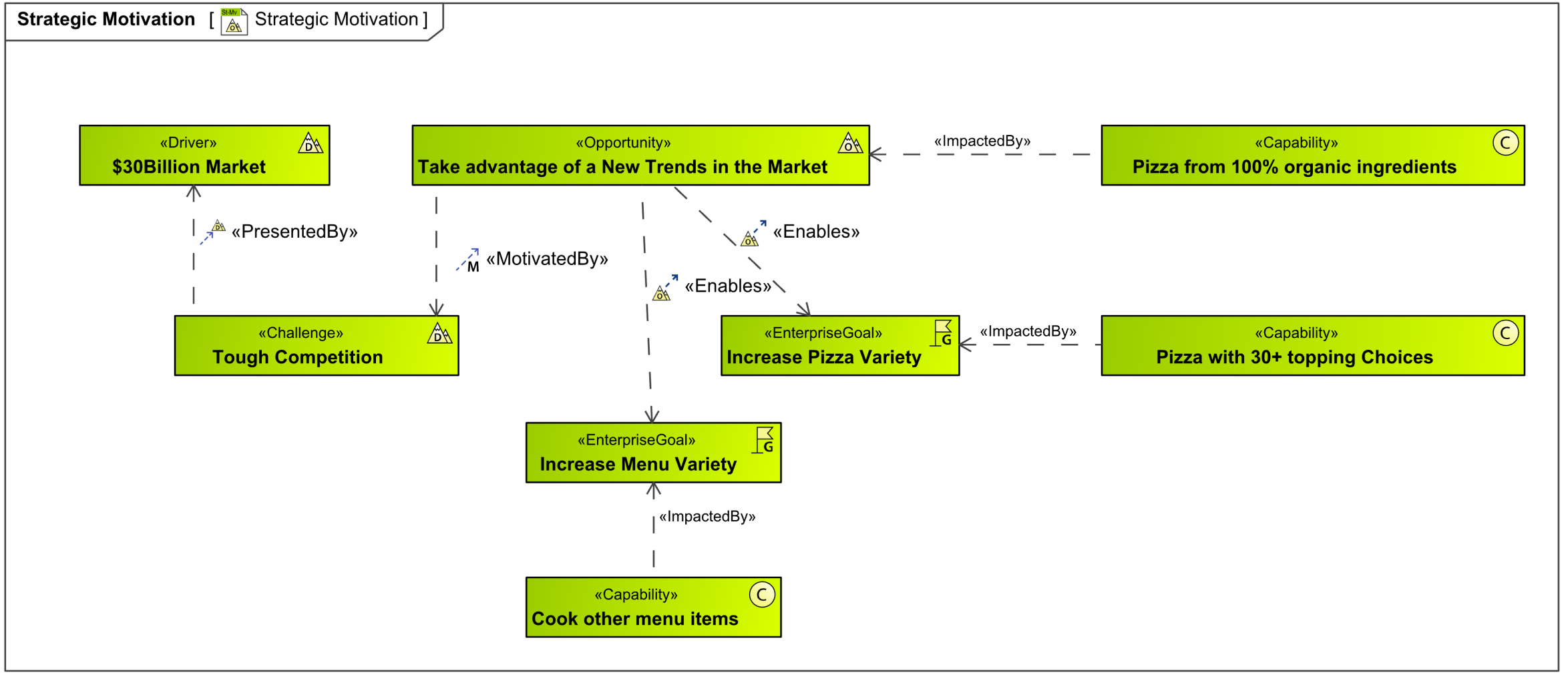
UAF	Motivation Mv	Taxonomy Tx	Structure Sr	Connectivity Cn	Processes Pr	States St	Sequences Sq	Information If	Parameters Pm	Constraints Ct	Roadmap Rm	Traceability Tr
Architecture Management Am	Architecture Principles Am-Mv	Architecture Extensions Am-Tx	Architecture Views Am-Sr	Architecture References Am-Cn	Architecture Development Method Am-Pr	Architecture Status Am-St	-	Dictionary Am-If	Architecture Parameters Am-Pm	Architecture Constraints Am-Ct	Architecture Roadmap Am-Rm	Architecture Traceability Am-Tr
				Summary & Overview Sm-Ov								
Strategic St	Strategic Motivation St-Mv	Strategic Taxonomy St-Tx	Strategic Str… St-Sr	…egic …nectivity St-Cn	Strategic Processes St-Pr	Strategic States St-St	-	Strategic Information St-If		Strategic Constraints St-Ct	Strategic Deployment, St-Rm-D Strategic Phasing St-Rm-P	Strategic Traceability St-Tr
Operational 0p		Operational Taxonomy Op-Tx	Operational Structure Op-Sr	Operational Connectivity Op-Cn	Operation… Processes Op-Pr	…tates	Operational Sequences Op-Sq	Operational Information Op-If		Operational Constraints Op-Ct	-	Operational Traceability Op-Tr
Services Sv		Services Taxonomy Sv-Tx	Services Structure Sv-Sr	Services Connectivity Sv-Cn	Services Processes Sv-Pr	Services States Sv-St	Services Sequences Sv-Sq			Services Constraints Sv-Ct	Services Roadmap Sv-Rm	Services Traceability Sv-Tr
Personnel Ps	Requirements Rq-Mv	Personnel Taxonomy Ps-Tx	Personnel Structure Ps-Sr	Personnel Connectivity Ps-Cn	Personnel Processes Ps-Pr	Personnel States Ps-St	Personnel Sequences Ps-Sq	Resources Information Rs-If	Environment En-Pm and Measurements Me-Pm and Risks Rk-Pm	Personnel Competence Ps-Ct-C Personnel Drivers PS-Ct-D Personnel Performance Ps-Ct-P	Personnel Availability Ps-Rm-A Personnel Evolution PS-Rm-E Personnel Forecast Ps-Rm-F	Personnel Traceability Ps-Tr
Resources Rs		Resources Taxonomy Rs-Tx	Resources Structure Rs-Sr	Resources Connectivity Rs-Cn	Resources Processes Rs-Pr	Resources States Rs-St	Resources Sequences Rs-Sq			Resources Constraints Rs-Ct	Resources evolution, Resources forecast Rs-Rm	Resources Traceability Rs-Tr
Security Sc	Security Controls Sc-Mv	Security Taxonomy Sc-Tx	Security Structure Sc-Sr	Security Connectivity Sc-Cn	Security Processes Sc-Pr	- -				Security Constraints Sc-Ct	-	Security Traceability Sc-Tr
Projects Pj	-	Project Taxonomy Pj-Tx	Project Structure Pj-Sr	Project Connectivity Pj-Cn	Project Processes Pj-Pr			-		- -	Project Roadmap Pj-Rm	Project Traceability Pj-Tr
Standards Sd	-	Standards Taxonomy Sd-Tx	Standards Structure Sd-Sr	- - - - -							Standards Roadmap Sd-Rm	Standards Traceability Sd-Tr
Actual Resources Ar			Actual Resources Structure, Ar-Sr	Actual Resources Connectivity, Ar-Cn	Simulation					Parametric Execution/ Evaluation	v1.2	

1
2
3
4
5

Motivation Aspect



Motivation Example

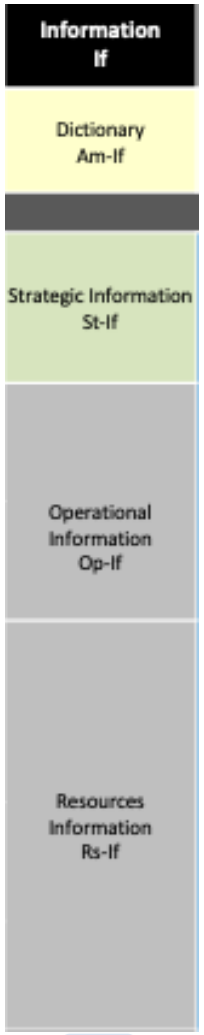


Architecture Management Viewpoint

UAF	Motivation Mv	Taxonomy Tx	Structure Sr	Connectivity Cn	Processes Pr	States St	Sequences Sq	Information If	Parameters Pm	Constraints Ct	Roadmap Rm	Traceability Tr
Architecture Management Am	Architecture Principles Am-Mv	Architecture Extensions Am-Tx	Architecture Views Am-Sr	Architecture References Am-Cn	Architecture Development Method Am-Pr	Architecture Status Am-St		Dictionary Am-If	Architecture Parameters Am-Pm	Architecture Constraints Am-Ct	Architecture Roadmap Am-Rm	Architecture Traceability Am-Tr

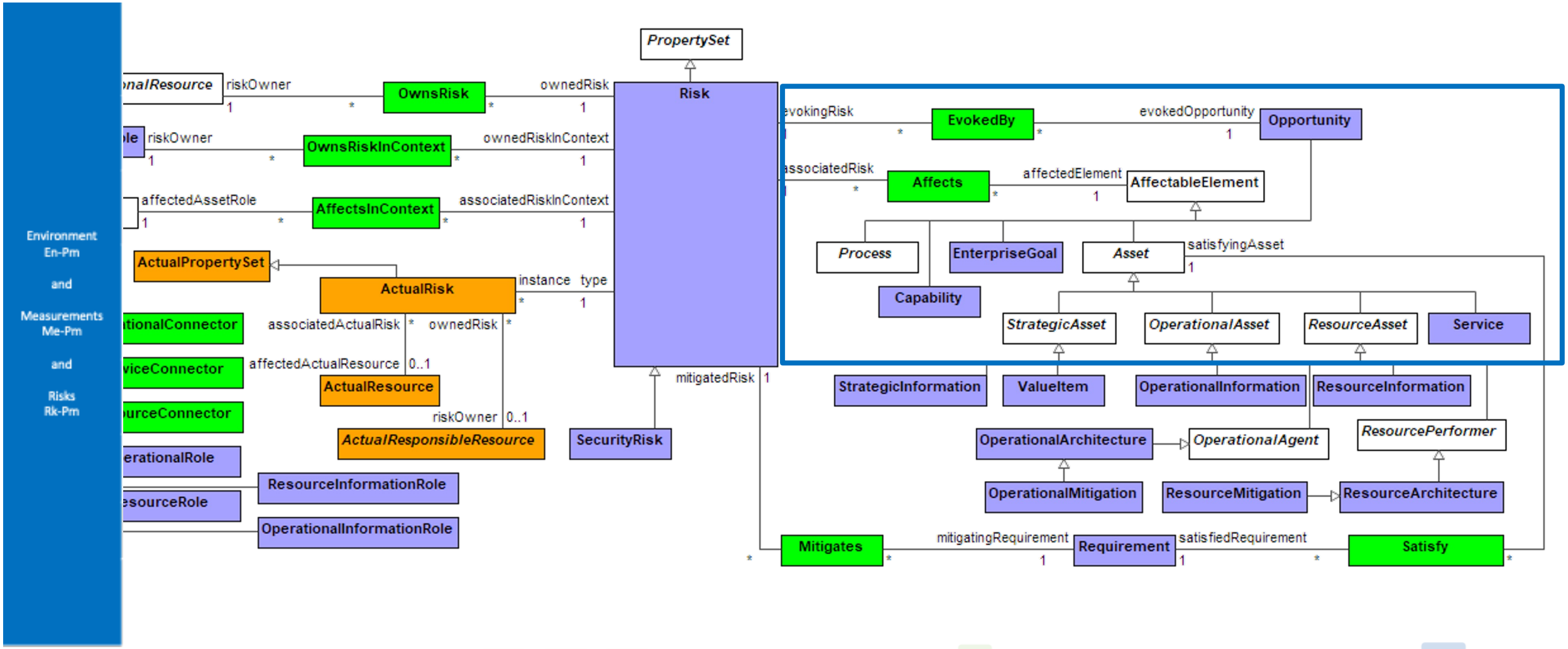
- Align the viewpoint with NAF V4
- Provide View Specifications for Architecture Management Domain
- Dictionary is now a part of Architecture Management Viewpoint and Information Aspect
- Architecture Principles is a new View Specification. Principle is a special kind of a Driver

Information Aspect

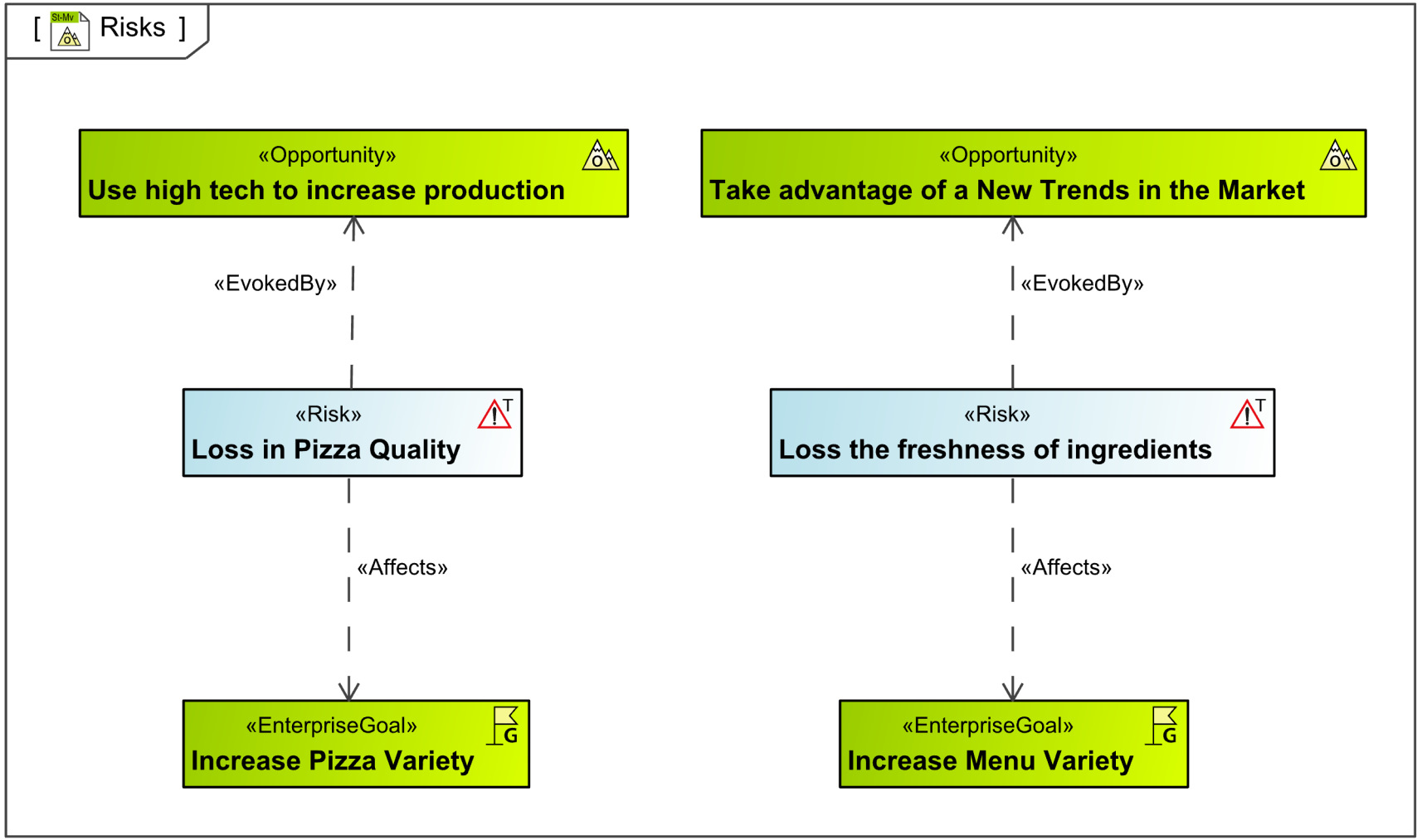


- Dictionary is a part of Information Aspect
- Strategic Information view specification introduced to capture:
  - Knowledge Capital - (Intellectual Property, Personnel & Organizations (eg, expertise, skills), Policies & Practices (patents, trade secrets, etc), Financial Good Will)
  - Know-How in developing 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

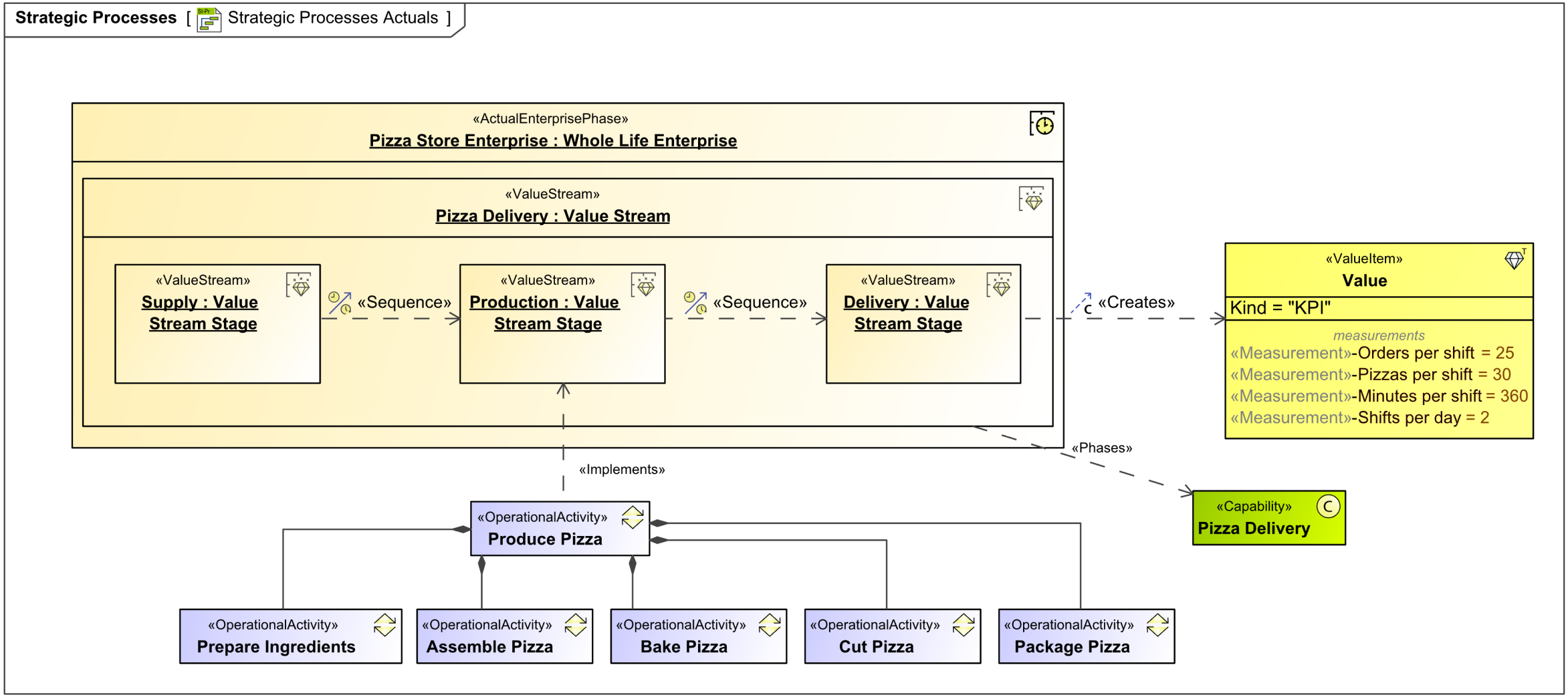
Risk – Cross Cutting Construct



Strategic Risk Example

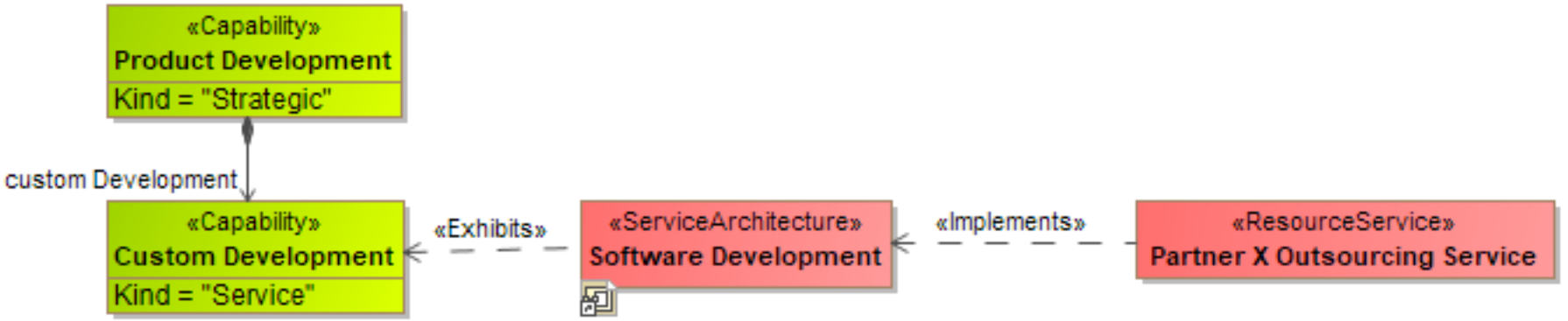


Strategic Processes – Value streams



Services Viewpoint

- 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.
- Services Contract introduced



Future

Future Roadmap

Future Roadmap

- UAF 1.3
  - Addition of Use Cases
  - Mission and Mission Threads
  - Improvements in Portfolio Management
  - Security Viewpoint improvements and alignment with RAAML
  - Process Guide for Model-Based Acquisition
  - Alignment with ISO style guide and ISO 42010 terminology
- UAF 2.0 (RFP in progress)
  - Standard Implementation in the SysML v2

UAF 2

- Standard implementation of the current version of UAF is based on SysML 1.x
  - SysML defines formalism 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 the text-based syntax aka programing language
  - Provides API based on REST API
- UAF WG collaborates with SysML SST
- UAF 2 will have either:
  - implementation in SysML v2 defined
  - DMM based on SysML v2 metamodel

Take Aways

- UAF is a STAND ALONE framework to support vide variety of architectures in different industries
- and
- alternatively it is an enabler for NAF and DoDAF
- which
- Incorporates the best practices of MBSE
- and
- Evolves taking in count user feedback

More on UAF

Intro to UAF

https://youtu.be/AWJk_7KtQ0w

Unified Architecture Framework (UAF)
https://www.linkedin.com/groups/8878655/

UAF Guide: https://www.omgwiki.org/uaf/lib/exe/fetch.php?media=dtc-21-12-13.pdf

UAF Annual Events

UAF Annual Events (2)

1. UAF and MBSE Information Day, 2015, Reston, VA
2. UAF and MBSE Summit, 2016, Reston, VA,
3. UAF and MBSE Summit, 2017, Reston, VA,
4. UAF, UPDM, and MBSE tutorials, 2017, Reston, VA,
5. UAF and MBSE Summit, 2017, Brussels, Belgium
6. UAF and MBSE tutorials, 2017, Brussels, Belgium
7. UAF and MBSE Summit, 2018, Reston, VA
8. UAF and MBSE tutorials, 2018, Reston, VA
9. MBSE-inspired Actionable Enterprise Architectures Summit, 2018, Ottawa, Canada
10. MBSE-inspired Actionable Enterprise Architectures Tutorials, 2018, Ottawa, Canada
11. MBSE-inspired Actionable Enterprise Architectures Summit, 2019, Reston, VA
12. UAF in the context of the NATO Architecture Framework (NAF), 2019, Amsterdam, Netherlands
13. UAF Summit: Actionable Architecture in the 21st century, 2020, Virtual
14. UAF Summit: Actionable Architecture in the 21st century and beyond, 2021, Virtual
15. UAF Summit: Actionable Architecture in the 21st century - Hybrid event, 2022, Reston, VA

32nd Annual INCOSE international symposium

hybrid event

Detroit, MI, USA
June 25 - 30, 2022

www.incose.org/symp2022

Thank you!