

Update on the Unified Architecture Framework® (UAF)



- Brief Introduction to UAF
- What's New in UAF 1.2
- UAF community
- Future Roadmap
- Q/A



OBJECT MANAGEMENT GROUP®

Outline

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Why OMG UAF?

- 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

Who is behind?

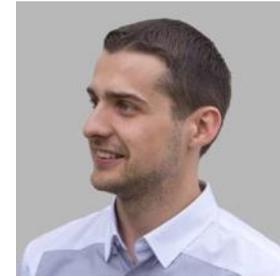
Tool vendors:

- 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 specification at a glance



Specification

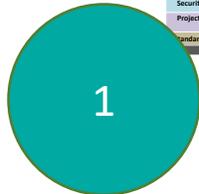
EA guide (EAG)

UAF v1.2

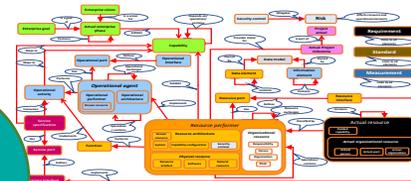
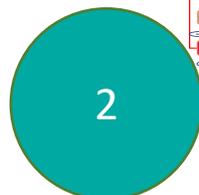


View specifications organized in domains and model kinds (Grid)

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

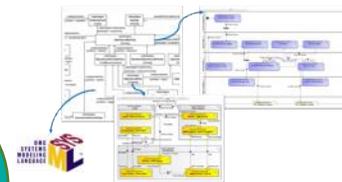


Domain MetaModel (DMM)



Modeling Language based on SysML (UAFP) (ML)

UAF v1.2

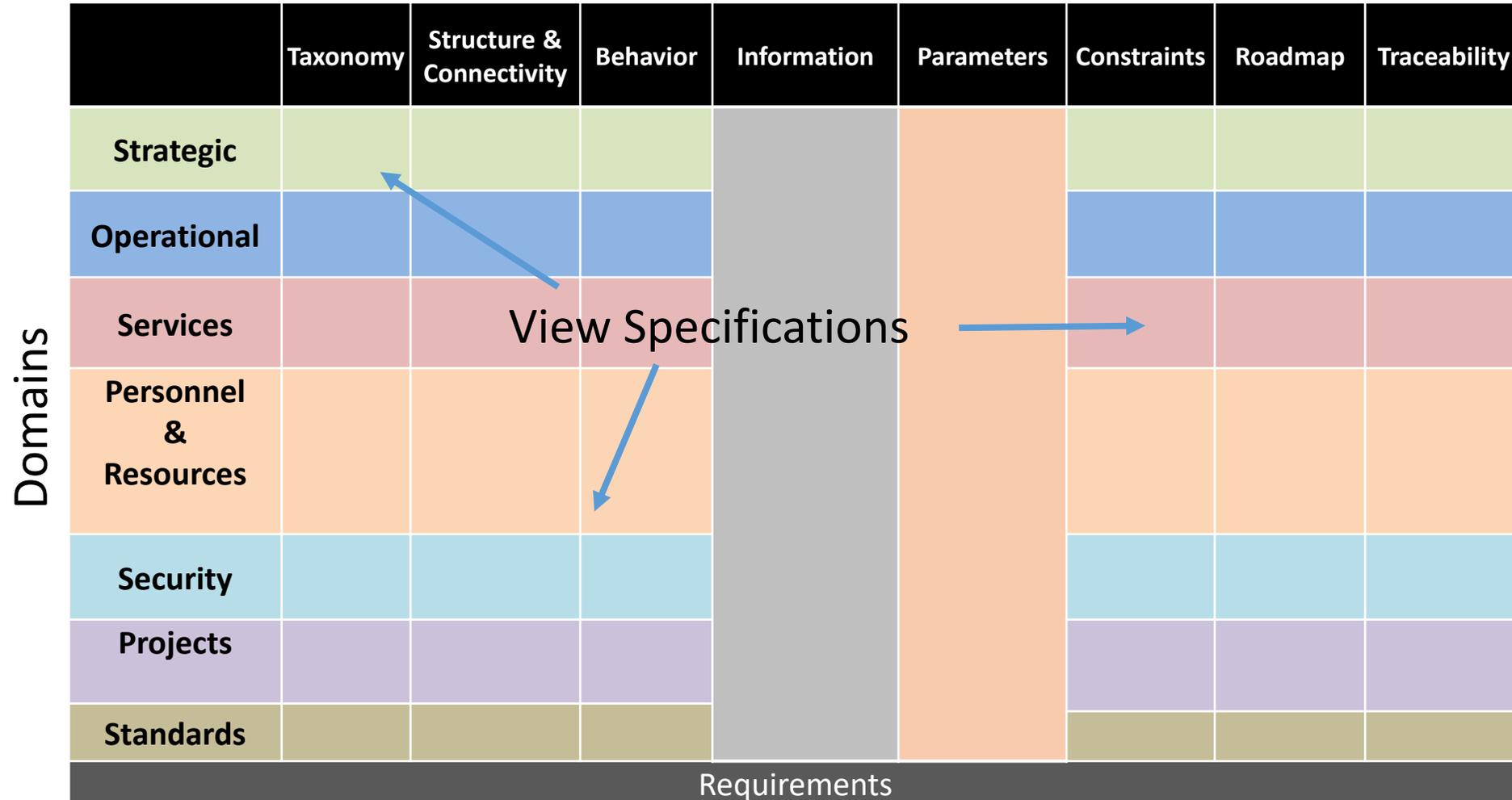


UAF grid

Model Kinds

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

View Specifications



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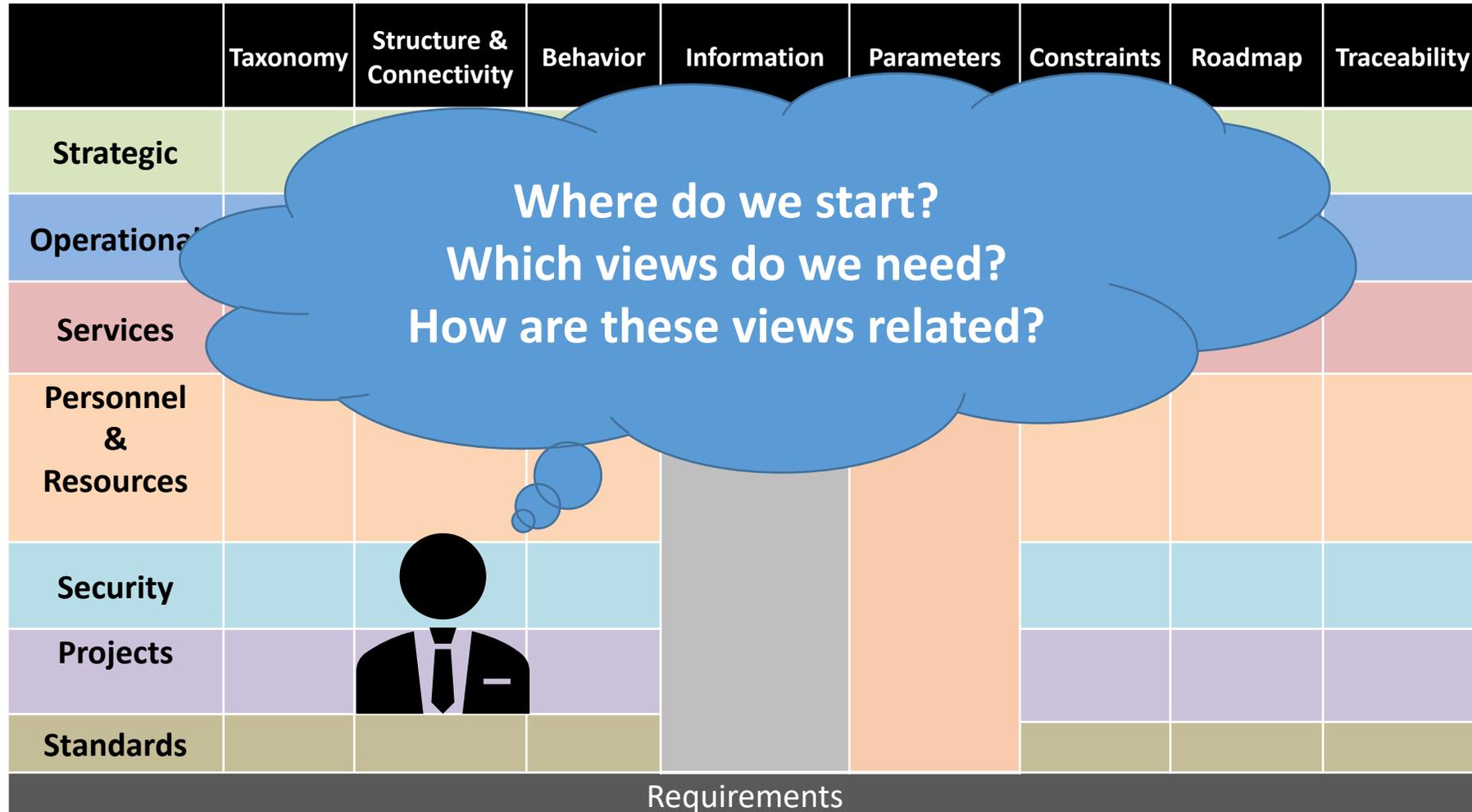
What's New in UAF 1.2

- 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

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EA Guide



- **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



- **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

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 - Support of Value Streams and updates to the Strategic Phasing
 - Risk becomes cross-cutting construct
- Alignment with ISO42010



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 Annotations Am-St	Dictionary Am-If	Architecture Parameters Am-Pm	Architecture Constraints Am-Ct	Architecture Roadmap Am-Rm	Architecture Traceability Am-Tr	
Summary & Overview												
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 and Measurements Me-Pm and Risks Rk-Pm	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 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		Operational Information Op-If	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	Personnel Competence Ps-Ct-C	Personnel Availability Ps-Rm-A	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	June 8th 2022		Actual Resources Structure, Ar-Sr	Actual Resources Connectivity, Ar-Cn	Simulation				Parametric Execution/ Evaluation	16	Draft v1.2	

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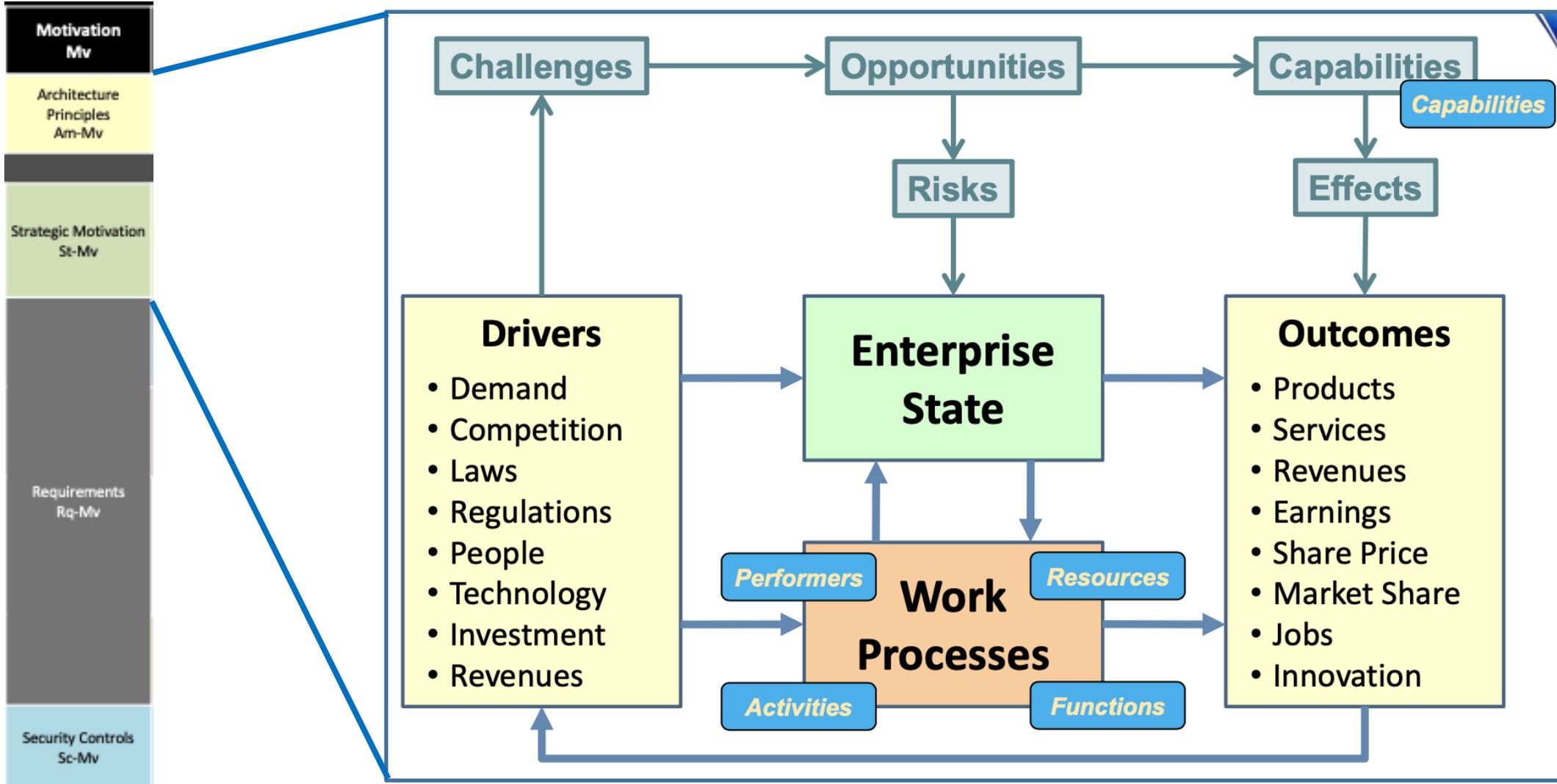
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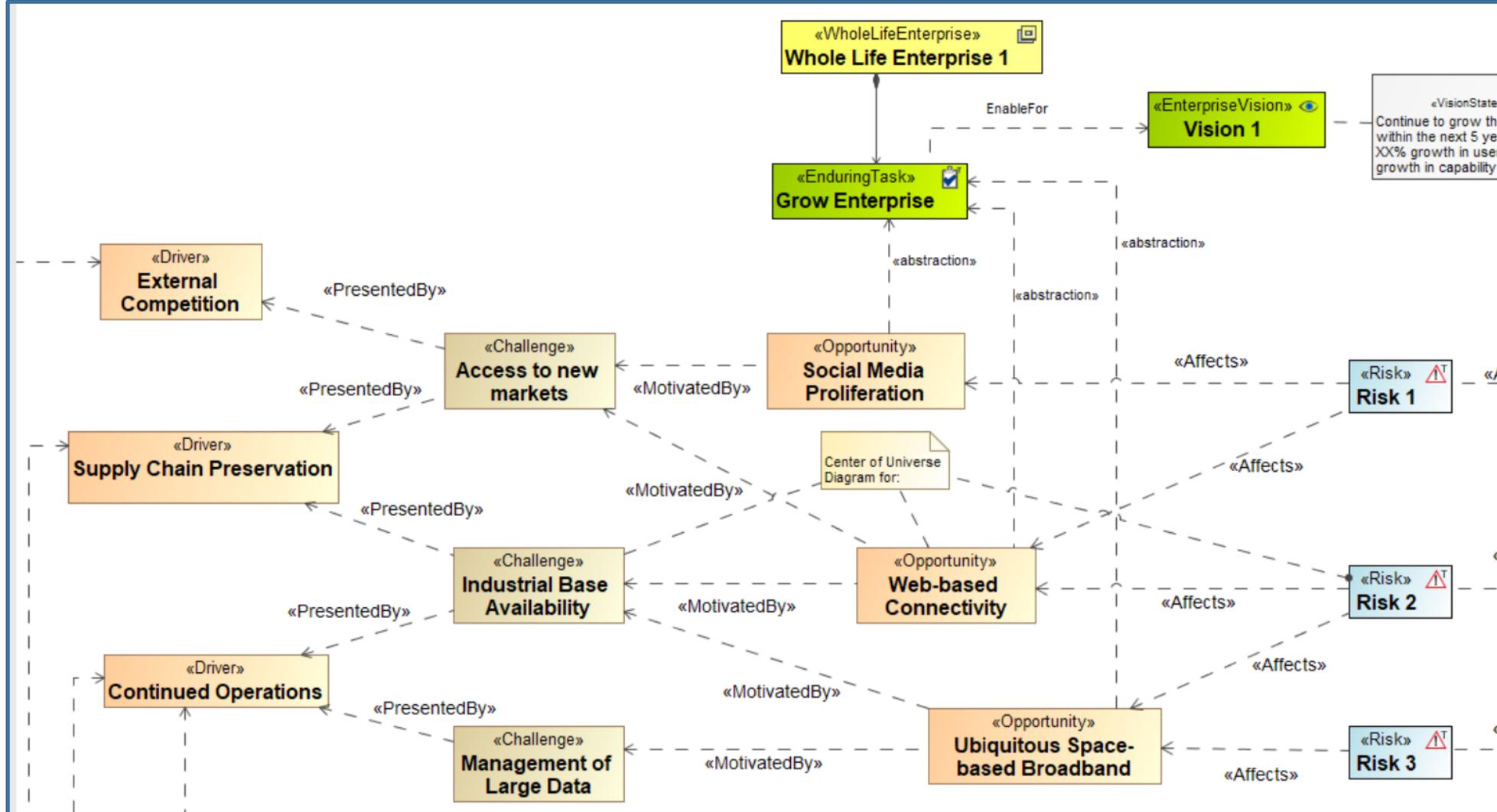
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Motivation Model Kind



Motivation Example

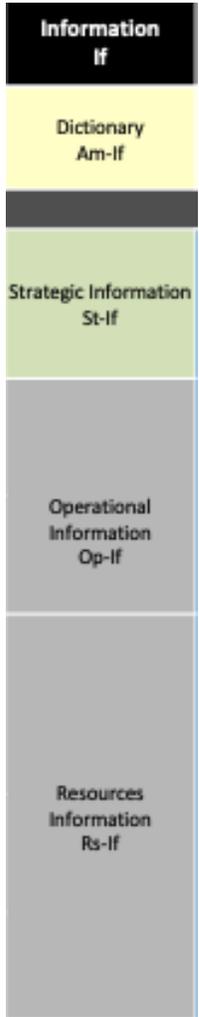


Architecture Management Domain

 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

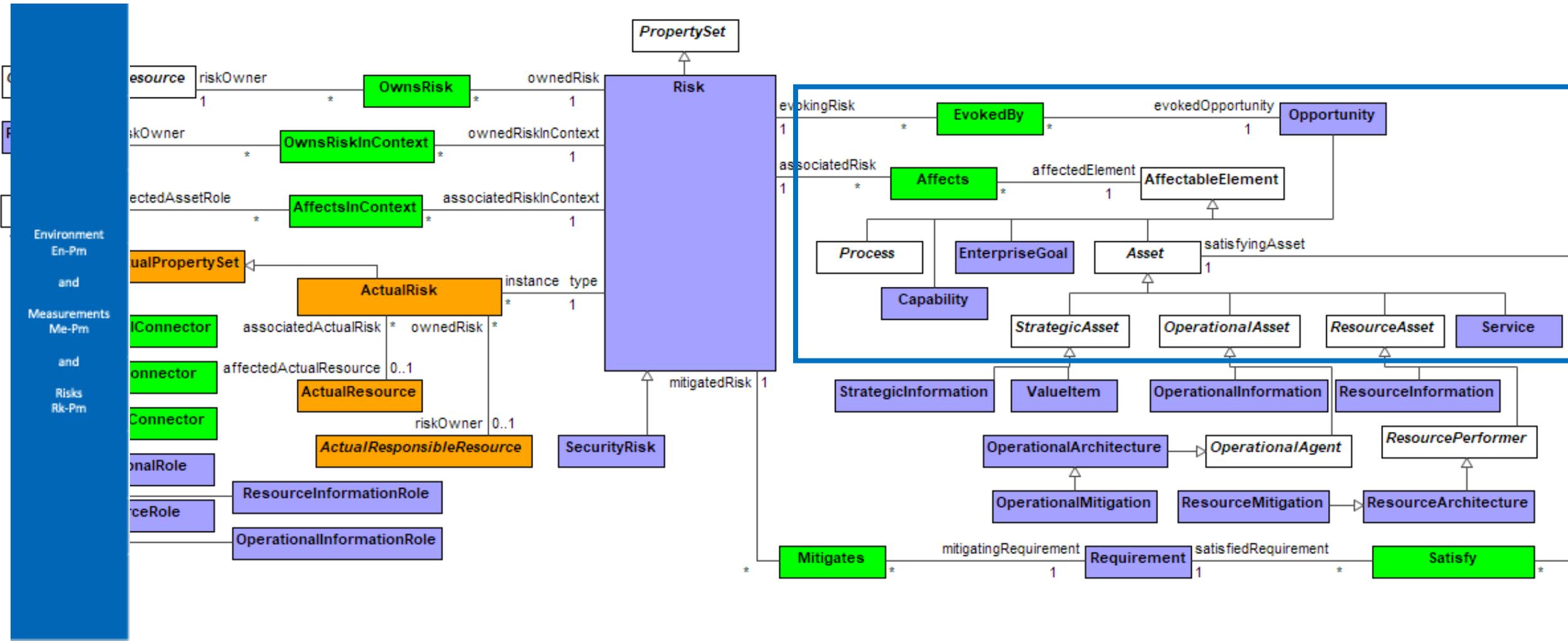
- Rename the Domain
- Align the domain with NAF V4
- Provide View Specifications for Architecture Management Domain
- Dictionary is a part of Architecture Management Domain
- Architecture Principles is a new View Specification. Principle is a special kind of a Driver.

Information Model Kind

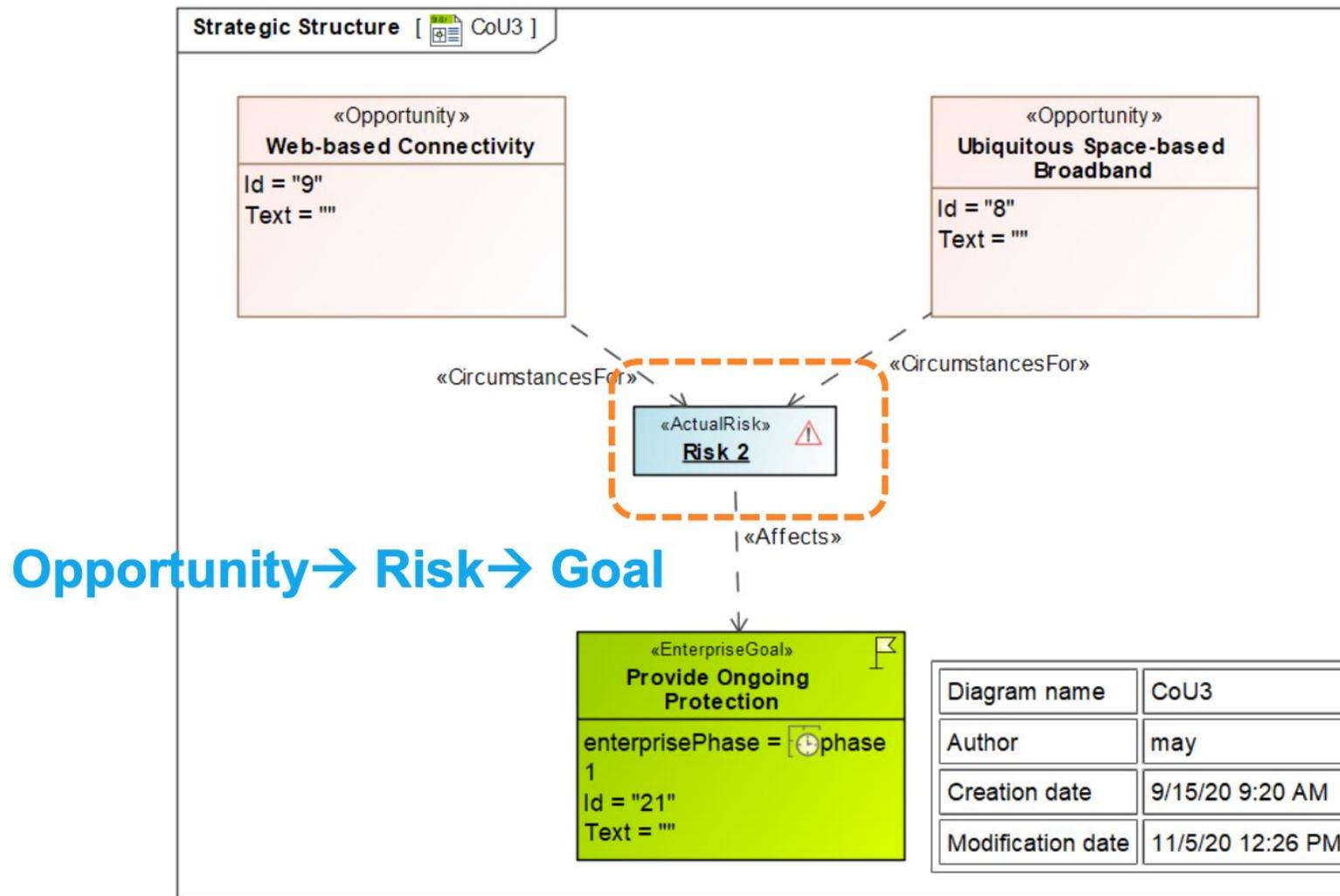


- Dictionary is a part of Information Model Kind
- Strategic Information to capture:
 - Knowledge Capital - (Intellectual Property, Personnel & Organizations (e.g., expertise, skills), Policies & Practices (patents, trade secrets, etc), Financial Good Will)
 - Know-How in developing and operating Enterprise 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

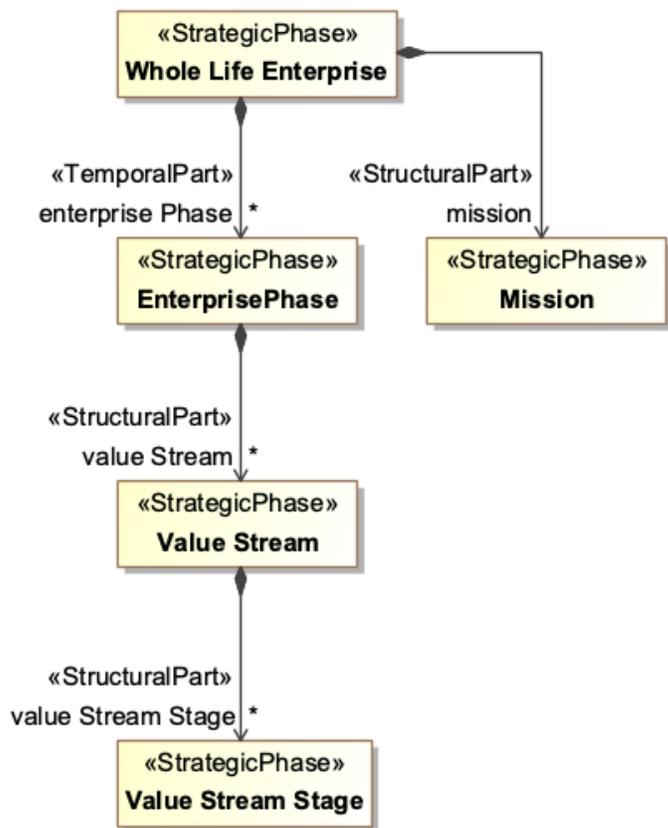


Risk Example

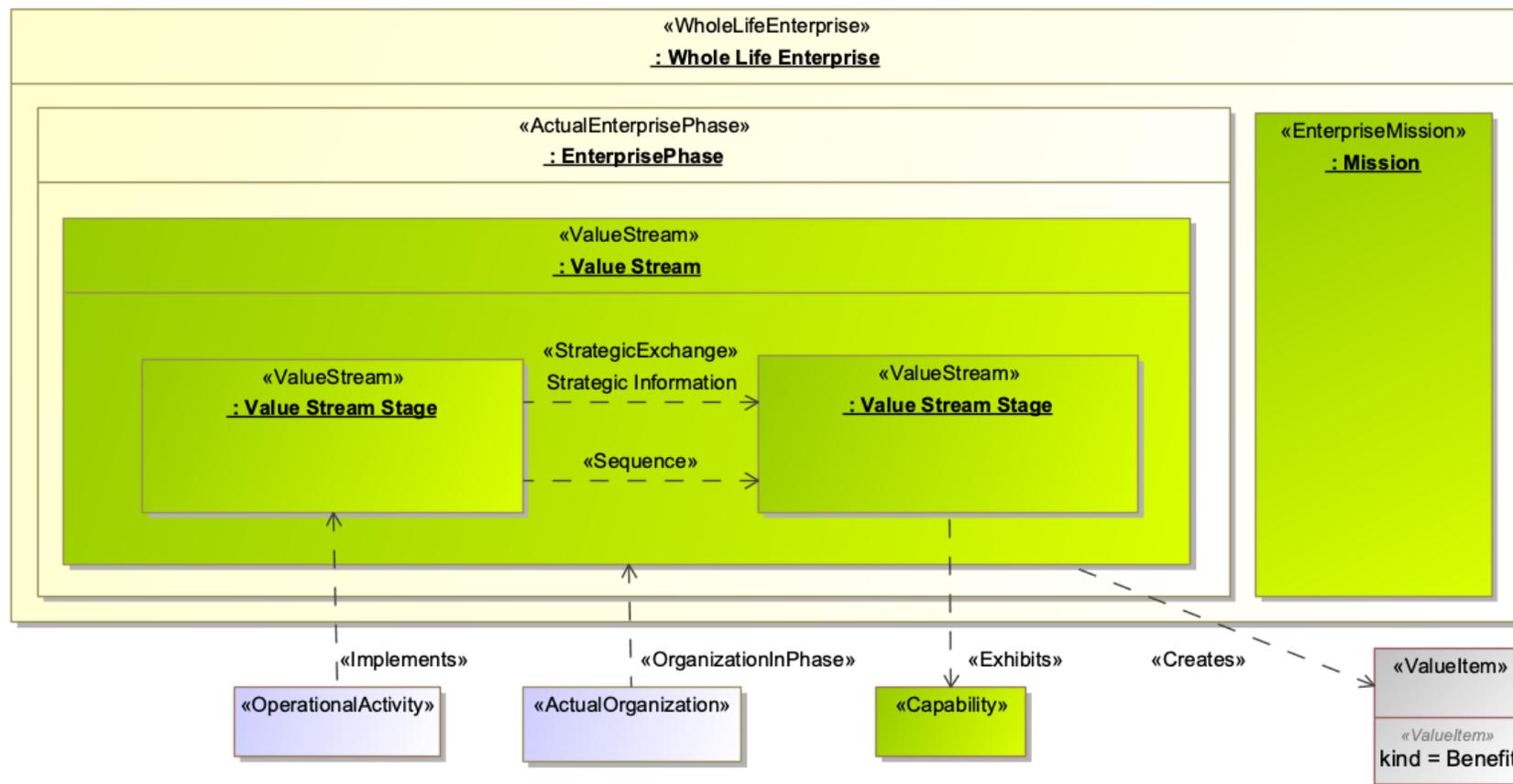


Strategic Phasing

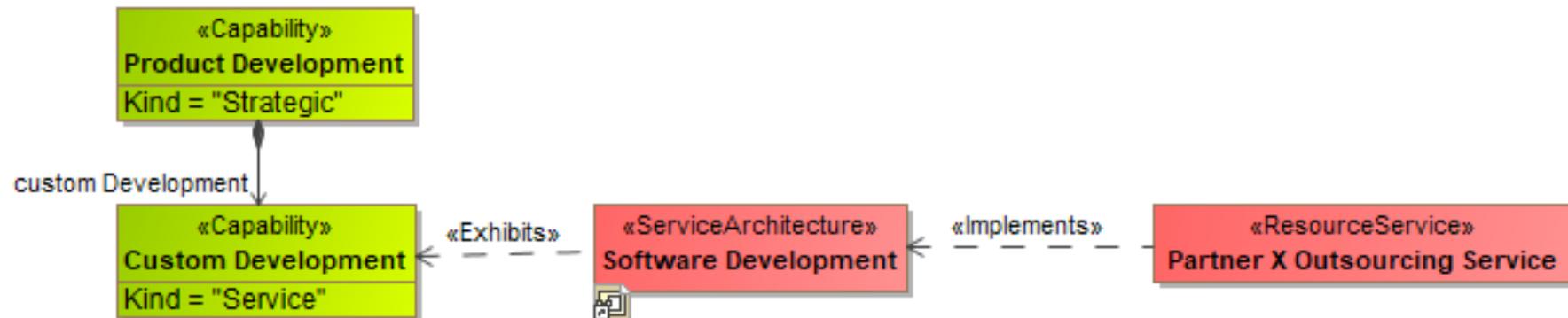
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- Improved Traceability between Service Layer and Operational and Resource layers.
- Service Specification renamed to Service
- Resource Service introduced to model technical services like web services, etc.



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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/>



**MAJOR GENERAL KIMBERLY A.
CRIDER**

Headquarters United States Space
Force

Mobilization Assistant to the Chief of
Space Operations



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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

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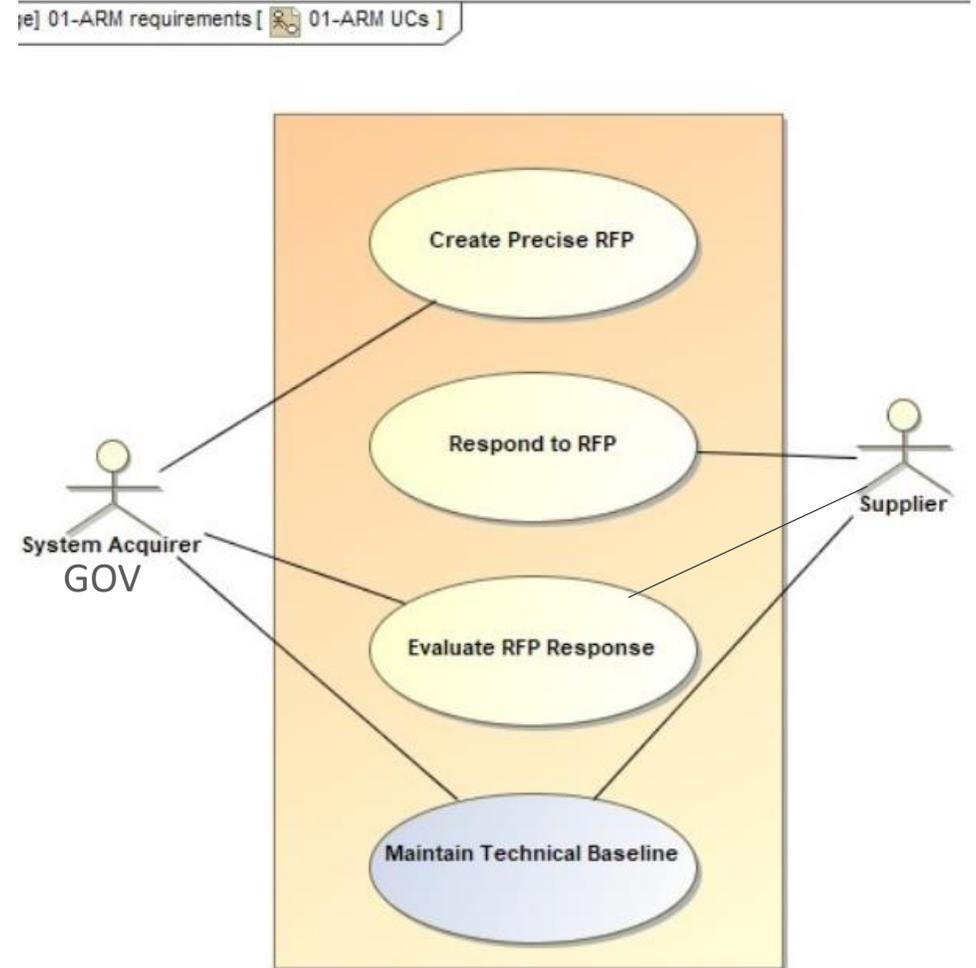
- Standard Implementation in the SysML v2

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



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Thank You!