UPDM – Unified Profile for DoDAF/MODAF

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UPDM Co-Chair

UPDM Group

Adaptive	Mitre
Artisan Software	Northrop Grumman
ASMG	L3 Comms
BAE Systems	MOD
DoD	NoMagic
DND	Raytheon
embeddedPlus	Rolls Royce
Generic	Sparx Systems
General Dynamics	VisumPoint
IBM	Selex SI
Lockheed Martin Co	Thales
Mega	Unisys

November 2010

What is UPDM? - Summary

- UPDM 1.0 is a standardized way of expressing DoDAF 1.5 and MODAF 1.2 artefacts using UML and SysML
  - UPDM is ***NOT*** a new Architectural Framework
  - UPDM is not a methodology or a process
  - UPDM 2.0 is scheduled to address DoDAF 2.0, MODAF 1.2, NAF 3.x, and DNDAF 1.7
- UPDM 1.0 was developed by members of the OMG with help from industry and government domain experts.
- UPDM 1.0 has been implemented by multiple tool vendors.
  - Tools supporting UPDM 1.0 are available now.

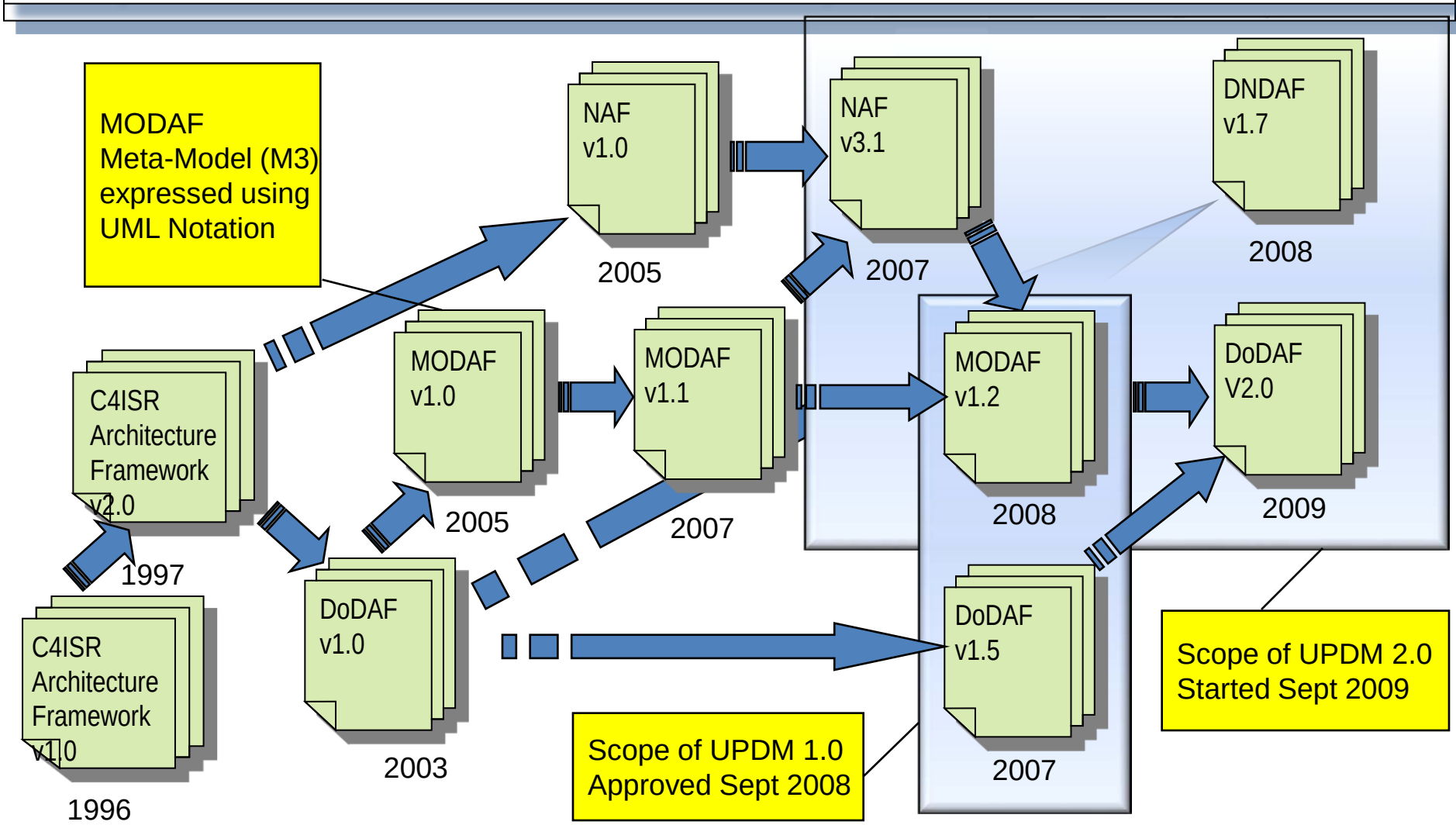
Outline

- Why?
  - The need for UPDM.
- When?
  - The history and projected timetable for UPDM.
- Who and Where?
  - Who is in the UPDM RFC Group?
- How?
  - How was the specification created?
- What?
  - What is UPDM in general?
  - A detailed look at a few things.
- Questions and answers?

Why? The need for UPDM.

- Motivation
  - US DoD and UK MOD interested in leveraging commercial standards for their Military Architecture Framework
  - Military Architecture Framework Tool Interoperability
    - Key Goal for DoD, MOD, Enterprise and System Architects and Engineers
  - Formal MetaModel basis for the Military Architecture Framework
    - Critical to Interoperability Objectives
    - Critical to Understanding Profile Requirements
- Proliferation of Military Architectural frameworks
  - DoDAF, MODAF, DNDAF, NAF, AGATE, ADOAF, MDAF, etc.
  - Defence organizations, contractors and tool vendors are hoping to find a way out of the alphabet soup.

Why and When: Historical Development of AF's.



Who and Where: UPDM Team Members

- US DoD Liaison - DoD/DISA, OSD CIO, Mitre, Silver Bullet
- UK MOD Liaison - UK MOD, ModelFutures
- Canada DND Liaison – DND and ASMG Ltd
- NATO – Generic AB on behalf of SwAF and on contract by FMV
- Tool Vendors – Adaptive, Atego (Co-Chair), EmbeddedPlus, IBM (Co-Chair), Mega, NoMagic (Co-Chair), Sparx Systems, Visumpoint
- Aerospace – BAE Systems, General Dynamics, L3 Communications, Lockheed Martin, Northrop Grumman, Raytheon, Rolls-Royce, Selex SI, Thales, Unisys
- Advisors – Decisive Analytics
- Distributed multi national team (US, UK, France, Sweden, Lithuania, Australia, Canada, Thailand, Italy)

How: UPDM 1.0 Requirements

- Mandatory Requirements
  - Domain Metamodel
  - Metamodel (abstract syntax and constraints)
  - Profile
  - Notation (concrete syntax)
  - DoDAF 1.5 and MODAF 1.2 artifacts
  - Support for custom views and viewpoints
  - Element taxonomy reference
  - Data interchange
- Optional Requirements
  - Extensibility to Other Architecture Frameworks
  - Representation of Architectural Patterns

How: UPDM Features

- Integrates with SoaML – The Service Oriented Architecture Modeling Language
- SysML Extensions with UPDM level 1
  - Facilitates integration of DoDAF and MODAF models for system of systems modeling with SysML models for systems modeling
  - Enables UPDM to fully leverage SysML features

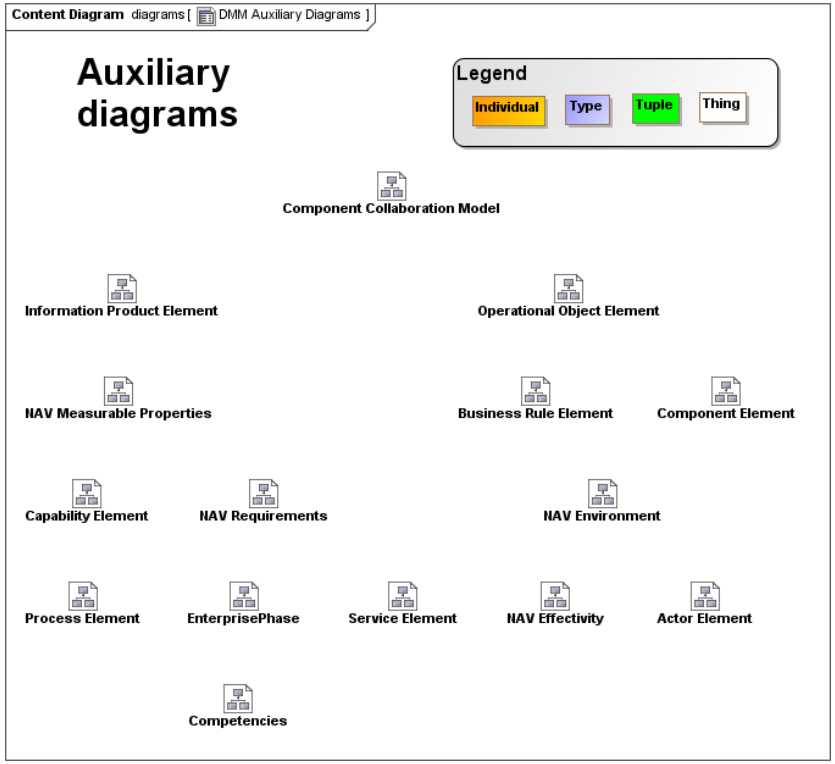
How: UPDM Level 1 Compliance SysML Extensions

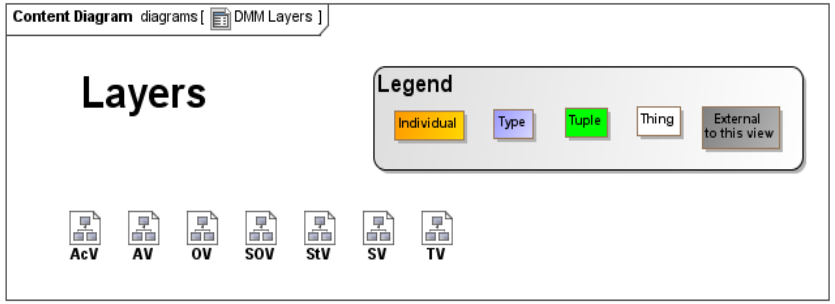
- Enables UPDM to leverage SysML features
  - SysML blocks to represent structural elements such as operational nodes, artifacts (systems), capability configurations, which enable the use of flow ports, item flows, and value properties with units and distributions
  - SysML activities to support continuous flow modeling, activity hierarchies, and support for enhanced functional flow block diagrams
  - SysML parametrics to enable the integration of engineering analysis with the architecture models (e.g., performance parameters in an SV-7 can be captured in parametric equations)
  - SysML allocations to support various types of mappings such as an SV-5 that maps system functions to operational activities
- Other SysML Features
  - SysML requirements enable text based requirements to be captured and traced to other model elements using the satisfy, derive, verify and refine relationships
  - SysML view and viewpoint enable provide for multiple perspectives of the model, and to manage, control, and organize information.
  - Callout notation

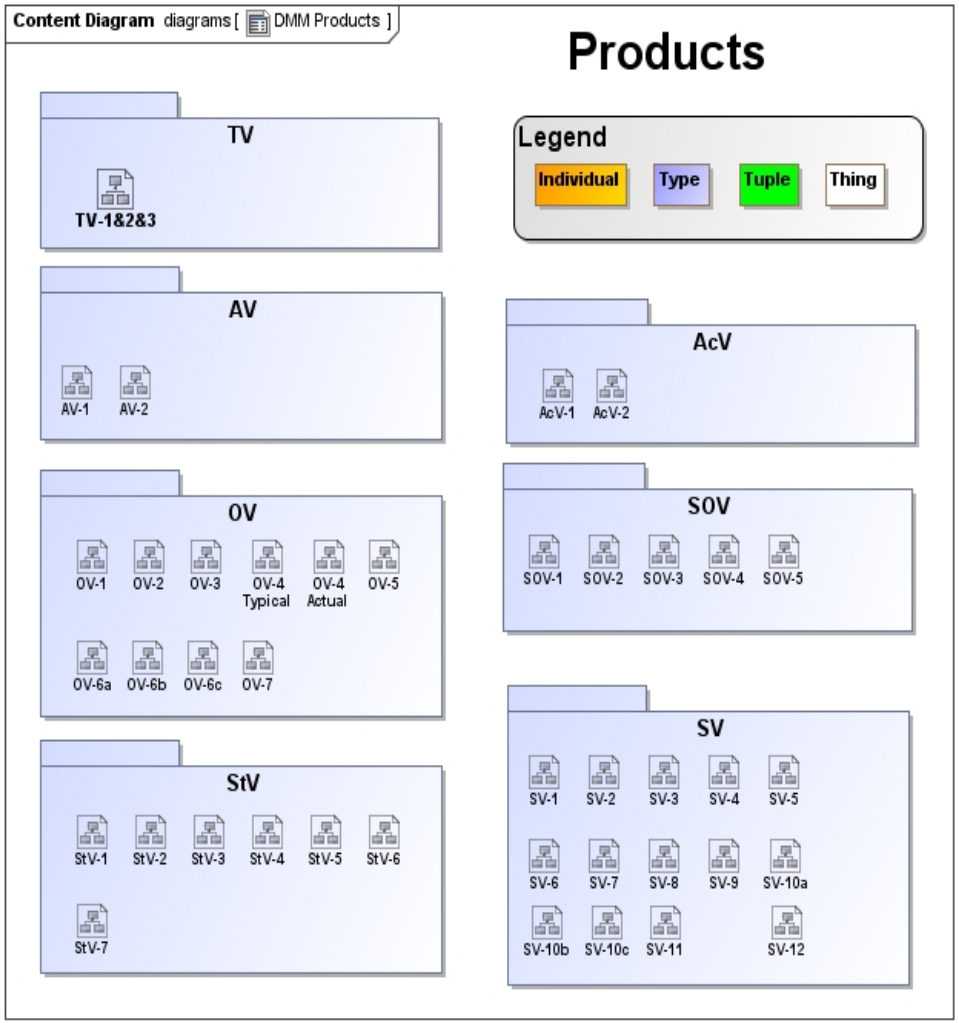
What is UPDM?

UPDM - Domain Meta Model

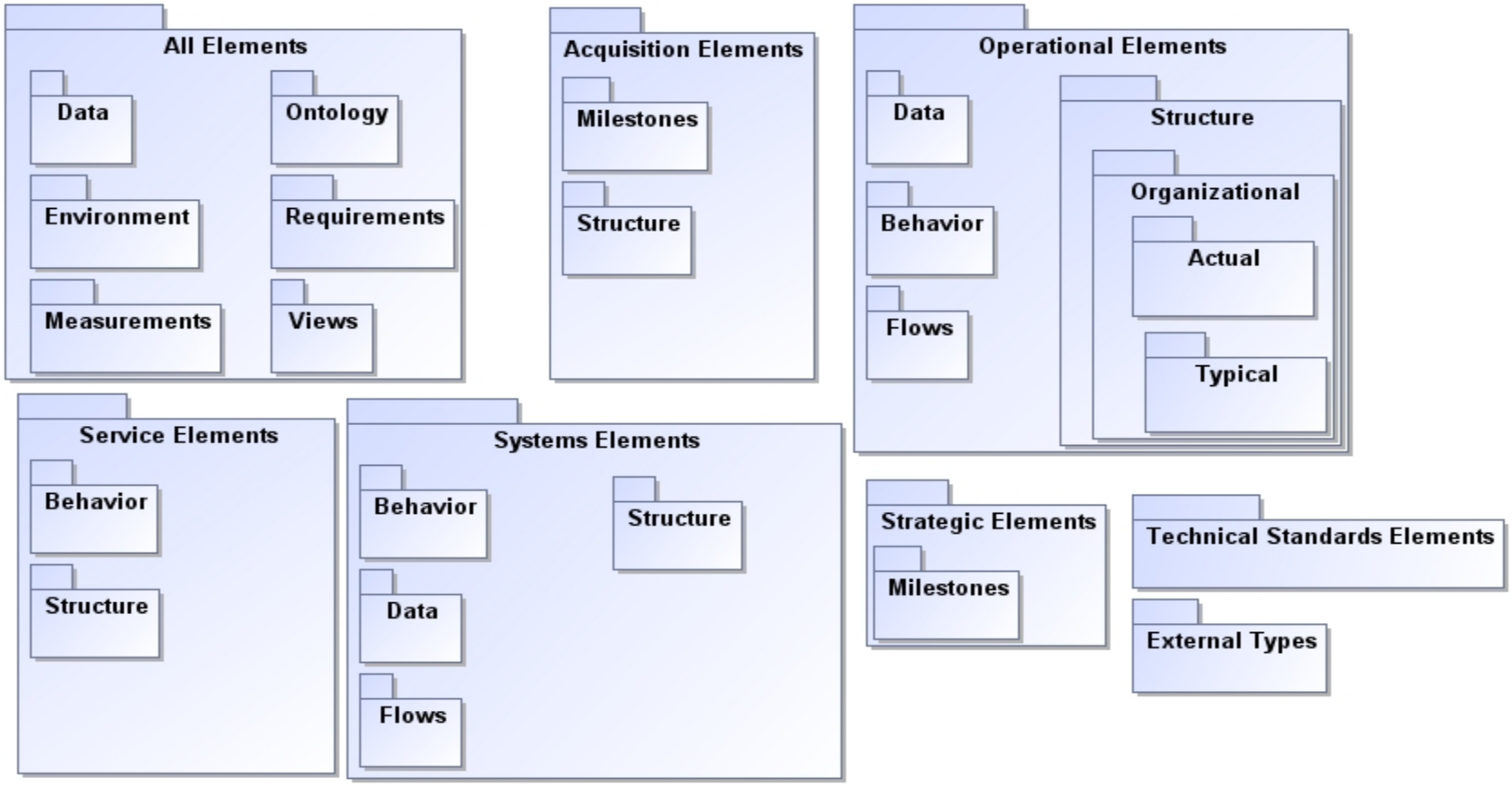
UPDM RFC - Domain Meta Model Summary





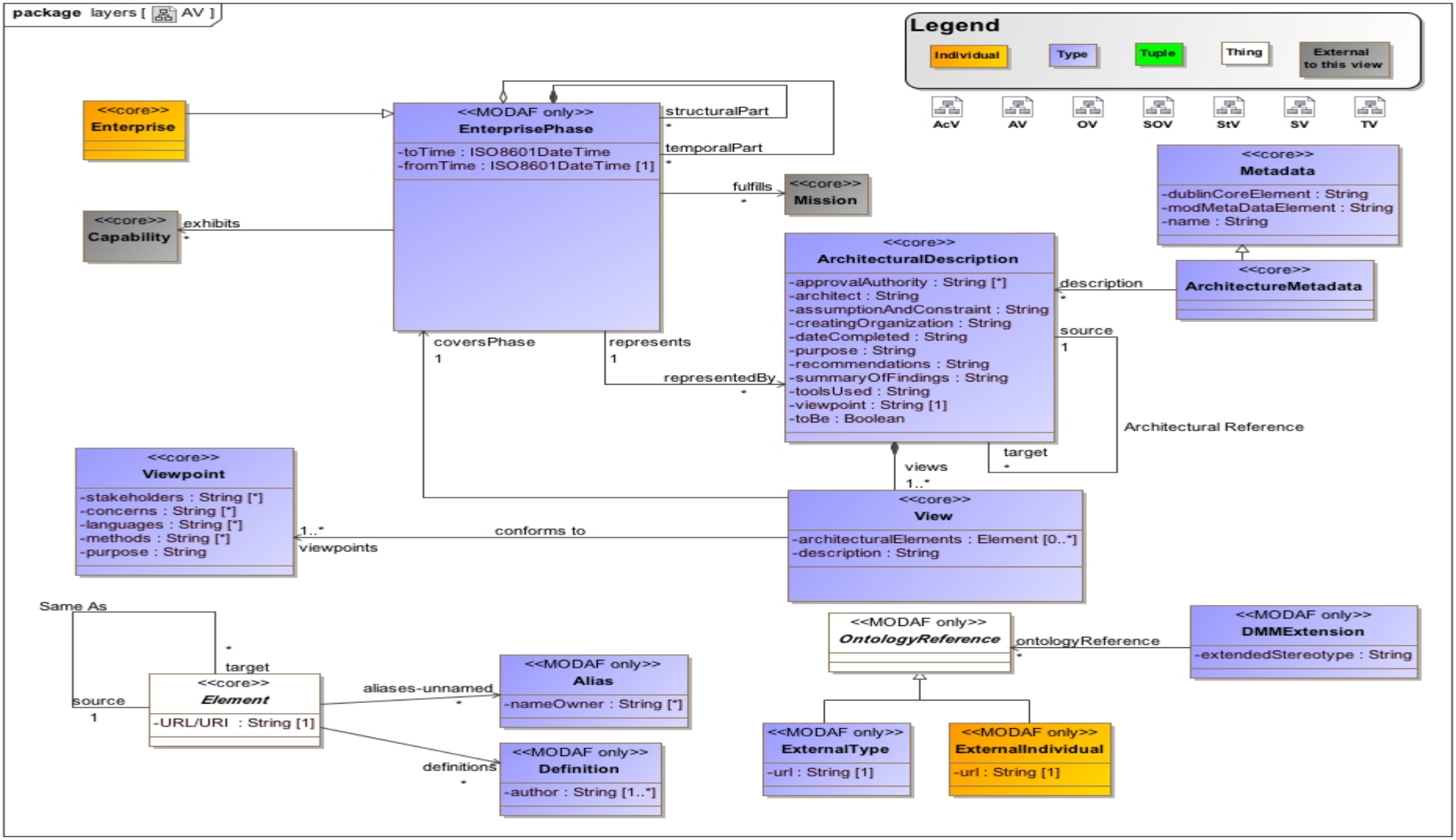


UPDM RFC - Domain Meta Model Summary (Packages.)

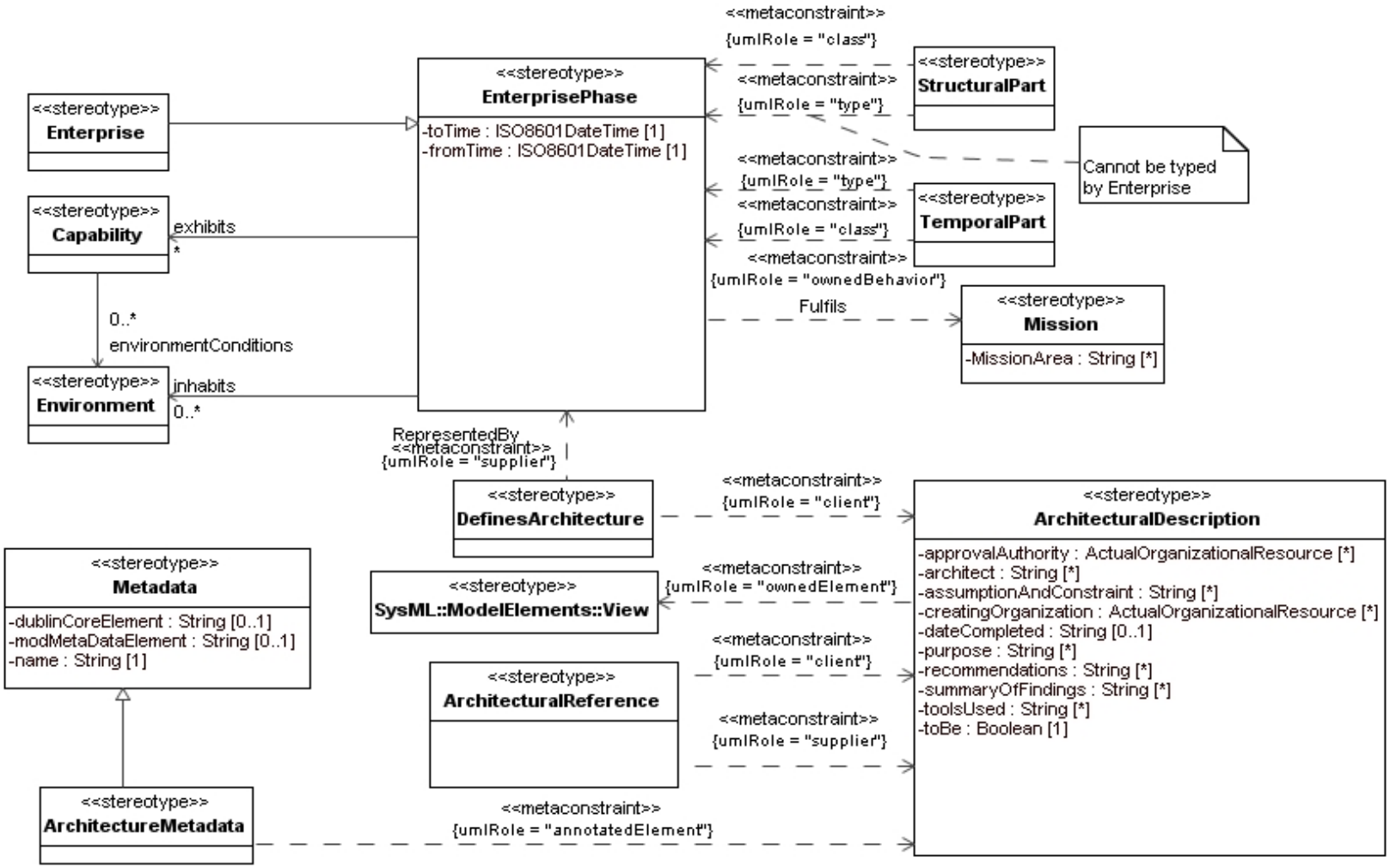


- Package structure organizes stereotypes by viewpoint
- Multiple viewpoints manage model complexity

UPDM RFC - Domain Meta Model Summary (AV)



UPDM RFC - Profile Summary (AV-1)



When: UPDM 2.0 Roadmap

- Signed and Released DoDAF 2.0 in June 2009
- Preparation of RFP for UPDM 2.0 (Next Slide)
- Issue UPDM 2.0 RFP Sept 2009
- Approved by the OMG in September, 2010
- Now in finalization
- Scheduled to complete in March, 2011
- ….

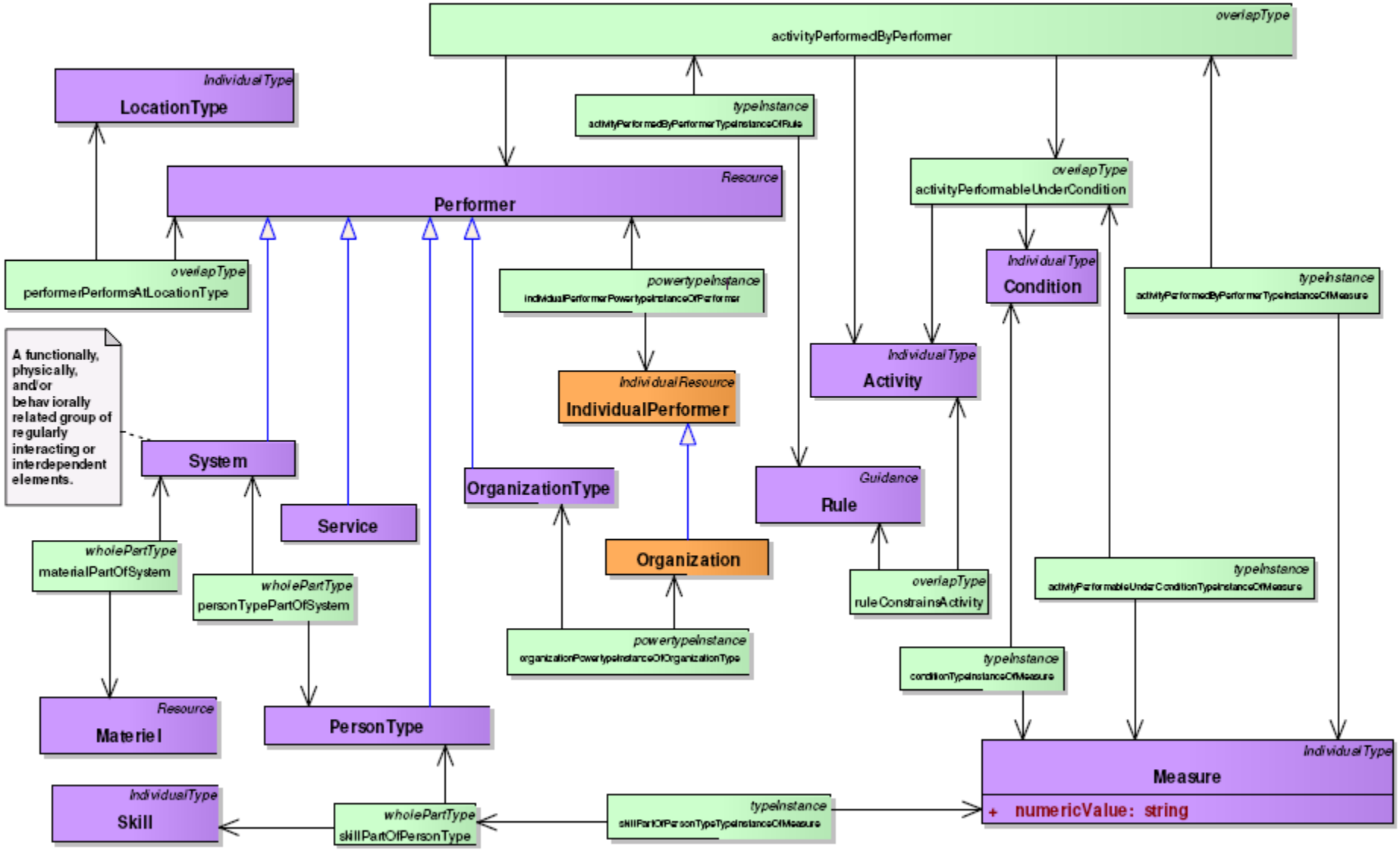
When: UPDM 2.0 Roadmap

- RFP for UPDM 2.0
  - Inclusion of DoDAF 2.0
  - Continuing support for MODAF 1.2
  - Support for NAF 3
  - Support for DNDAF including the Information and Security views
  - Human Factors Views based on MODAF and DNDAF
  - Business process Modeling Notation
    - UPDM v2 optionally could use BPMN to model operational views
  - Others?

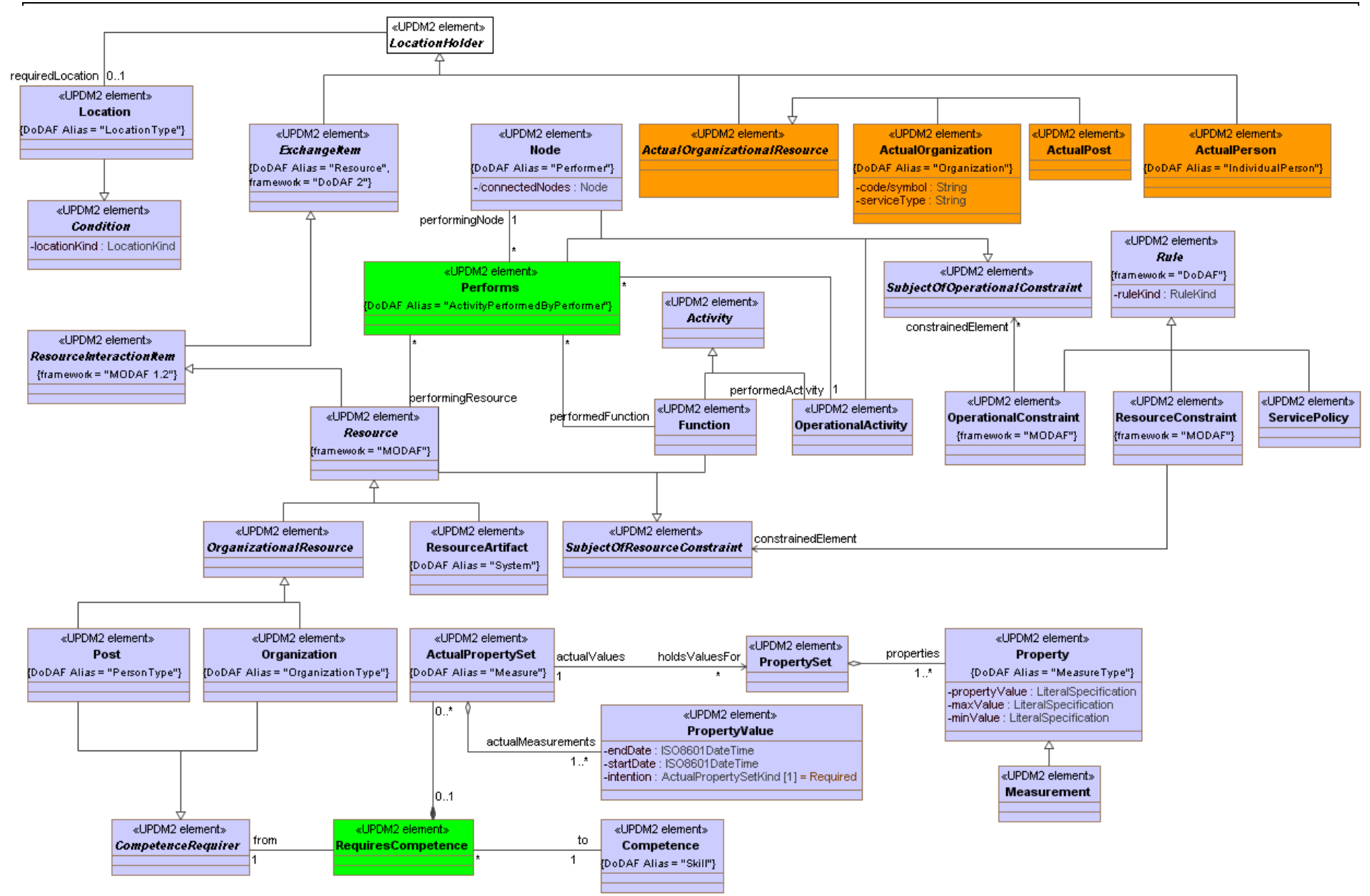
IDEAS Recap - Top-Level Foundation

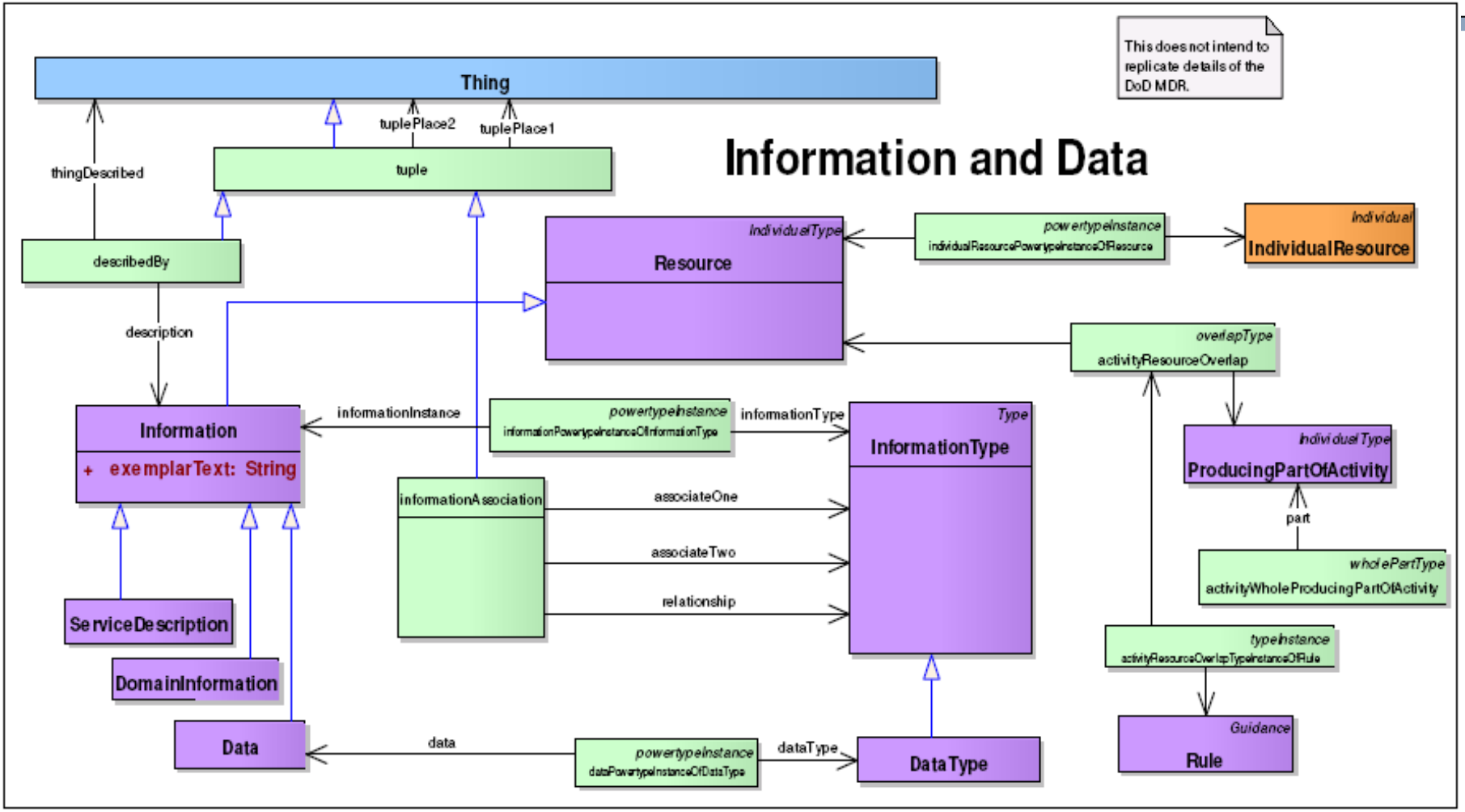
- Developed by an international group of computer scientists, engineers, mathematicians, and philosophers under defense sponsorship.
- See http://www.ideasgroup.org or http://en.wikipedia.org/wiki/IDEAS_Group

Performer

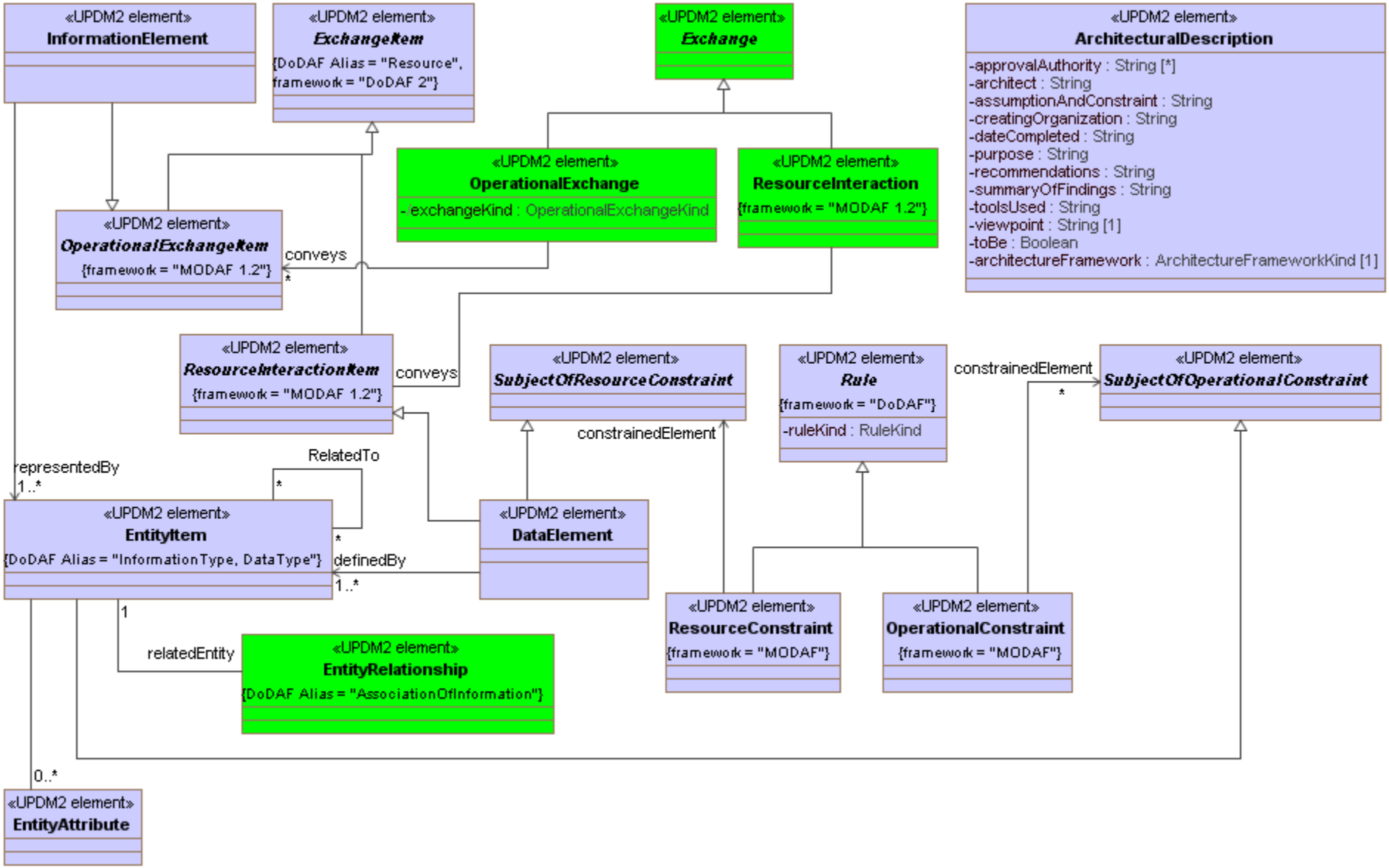

overlapType
activityPerformedByPerformer
IndividualType
LocationType
typeInstance
activityPerformedByPerformerTypeInstanceOfRule
Resource
Performer
overlapType
activityPerformableUnderCondition
overlapType
performerPerformsAtLocationType
powertypeInstance
individualPerformerPowertypeInstanceOfPerformer
IndividualType
Condition
typeInstance
activityPerformedByPerformerTypeInstanceOfMeasure
A functionally, physically, and/or behaviorally related group of regularly interacting or interdependent elements.
IndividualResource
IndividualPerformer
IndividualType
Activity
System
OrganizationType
Guidance
Rule
Service
wholePartType
materialPartOfSystem
Organization
wholePartType
personTypePartOfSystem
overlapType
ruleConstrainsActivity
typeInstance
activityPerformableUnderConditionTypeInstanceOfMeasure
powertypeInstance
organizationPowertypeInstanceOfOrganizationType
typeInstance
conditionTypeInstanceOfMeasure
Resource
Materiel
PersonType
IndividualType
Measure
+ numericValue: string
IndividualType
Skill
wholePartType
skillPartOfPersonType
typeInstance
skillPartOfPersonTypeTypeInstanceOfMeasure

UPDM – Unified Profile for DoDAF and MODAF




Information and Data
This does not intend to replicate details of the DoD MDR.
Thing
tuplePlace2
tuplePlace1
thingDescribed
tuple
describedBy
description
Information
+ exemplarText: String
ServiceDescription
DomainInformation
Data
informationInstance
informationAssociation
powertypeInstance
informationPowertypeInstanceOfInformationType
informationType
Type
InformationType
associateOne
associateTwo
relationship
data
powertypeInstance
dataPowertypeInstanceOfDataType
dataType
DataType
IndividualType
Resource
powertypeInstance
individualResourcePowertypeInstanceOfResource
Individual
IndividualResource
overlapType
activityResourceOverlap
IndividualType
ProducingPartOfActivity
part
wholePartType
activityWholeProducingPartOfActivity
typeInstance
activityResourceOverlapTypeInstanceOfRule
Guidance
Rule

UPDM – Unified Profile for DoDAF and MODAF



International Adoption of UPDM

- United States
  - DoD statements of support issued
  - Vendor presentations given to DoD, industry, conferences
  - UPDM being used on both bids and projects
- Great Britain
  - MOD statements of support issued
  - Vendor presentations given to MOD, industry, conferences
  - UPDM being used on both bids and projects
- France
  - DGA favoring NATO NAF over AGATE; investigating UPDM
  - Vendor presentations given to DGA, industry, conferences

DoD at OMG

DoD and MOD Recommended the C4i TF to vote and recommend formal Issuance of the UPDM Request For Comment (RFC):

- Critical Role for Enterprise Architecture
- Time is now for Baseline Requirements
- Sound Methodology - UPDM RFC
- DoD long standing policy on standards
- Strong Inter-Governmental Support

DEPARTMENT OF DEFENSE
CHIEF INFORMATION OFFICER
Creating an Information Advantage

DoD and MOD Position

- Joint Statement (18 Sep 08)
  - Brian G. Wilczynski, Director, Enterprise Architecture & Standards, Office of the Department of Defense Deputy Chief Information Officer
  - John Keefe, United Kingdom Ministry of Defence
  - "UK MOD fully endorses and supports the position stated by the US DoD".

DEPARTMENT OF DEFENSE
CHIEF INFORMATION OFFICER
Creating an Information Advantage

International Adoption of UPDM cont'd

- Sweden
  - FMV statements of support issued
  - Swedish SwAF have now adopted MODAF as standard
  - Vendor presentations given to SwAF, industry
- Canada
  - DND participation in UPDM effort at OMG
  - Evaluating its use to support DNDAF
  - Provided security views
  - Vendor presentations given to DND, industry, conferences
  - Public safety looking to adopt (Homeland Security)
- Norway
  - Vendor presentations given to defence dept, industry

International Adoption of UPDM cont'd

- NATO
  - UPDM update presentation given at NATO C3A briefing
  - UPDM group coordinating with NATO C3A for UPDM 2.0 oversight and support
- Italy
  - Vendor presentations given to Italian Armed forces, industry, conferences
  - UPDM being used on both bids and projects
- Holland
  - Vendor presentations given to Dutch Armed forces, industry, conferences

International Adoption of UPDM cont'd

- Israel
  - Vendor presentations given to Israeli Armed forces, industry, conferences
- Australia
  - Vendor presentations given to industry, conferences, Government Agencies.
  - UPDM being used on projects, bids
- India
  - Vendor presentations given to industry, conferences

International Adoption of UPDM cont'd

- Use of UPDM for non-military applications
  - Disaster planning, event planning, space missions: satellites, manned missions, non-military government departments, humanitarian relief operations, industry infrastructure planning, banking, etc.

- <u>All of the above cited standardization and interchange as essential reasons for considering UPDM</u>

Discussion

Questions?