DoD Unified Profile for DoDAF & MoDAF (UPDM)  
DoD Enterprise Architecture Conference 2009  
UPDM Status in the OMG  
04 June 2009

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Defense-Industry Challenge: Synchronization of DoDAF-UPDM Lifecycles

1. **Governments**
   Produce Baselines
   Develop, Evolve & Harmonize
   Defense Enterprise Architecture Frameworks
   For Acquisition

2. **Industry**
   Produces
   Develops Generic Modeling & Engineering Standards

3. **Vendors**
   Produce Product Versions
   Defense Domain Tools “Just-In-Time”

Leverages Vendors Standards-Based Tools & Government Frameworks
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
Critical Role of UPDM Architecture Exchange

- DoD Architecture Framework (DoDAF)

- DoD/MOD needs standards-based specification and standards based tools to bridge the gaps among enterprise architecture policy, guidance, and the engineering of actual hardware, software, and human systems

- UPDM RFC meets DoDAF 1.5 & MoDAF 1.2
  - DoD and MOD Baseline; Signed & Published.
Vendor Development

- Vendors are ready for speedy implementation of UPDM RFC.
UPDM Sound Methodology

- Model Driven Architecture (MDA)
  - Based on analysis of DoDAF 1.5, MODAF 1.2, and NAF3

- Supports Exchange & Reuse of architecture models through XMI standard

- Leverages existing tools based on UML 2 as well as SysML

- Future-oriented
  - Maximization of shared Core Concepts & Elements
  - Convergence between DoDAF & MoDAF
  - Specialization into DoDAF only Elements & MoDAF only
  - Elements bodes well for future flexibility & openness to evolving ideas, international requirements, & continued fulfillment of national needs.
  - Sys ML you have a syml definition for flow down
DoD and MOD Support for UPDM

- DoD and MOD Strongly Supports Industry Standardization of UPDM at OMG and Ultimately International Standardization at ISO
  - 08-12 Dec 08 OMG Adoption in Santa Clara
  - 23-27 Mar 09 OMG Finalization
  - 22-26 Jun 09 OMG Costa Rica

- DoD will
  - Recommend to move it to Emerging Standard status
  - Upgrade to Mandated Standard
  - Promote internationalization through OMG and ISO
  - Present status at ITSC February 2009
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”.
Key Meetings

- UPDM Engineering Development Team
- 11 June 09 - DARS Users Group Meeting
- 12 June 09 - UPDM Vendors Engineering Team Meeting

MITRE-1 Building #3, Room: IT510
7525 Colshire Drive
McLean, VA 22102-7539
Reception Desk: (703) 983-6004
http://www.mitre.org/about/locations/mitre1_map.html
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: Historical Development of AF’s.

- **MODAF Meta-Model (M3)** expressed using UML Notation
- **C4ISR Architecture Framework** v1.0: 1996
- **DoDAF v1.0**: 1997
- **C4ISR Architecture Framework** v1.0: 1996
- **MODAF v1.0**: 2003
- **DoDAF v1.0 Approved Dec 2008**: 2003
- **MODAF v1.1**: 2005
- **NAF v1.0**: 2005
- **DoDAF v1.5**: 2007
- **MODAF v1.2**: 2007
- **NAF v3.0**: 2007
- **DNDAF v1.0**: 2008
- **DoDAF v1.2**: 2008
- **MODAF v1.1**: 2008
- **DoDAF v1.5**: 2009
- **Scope of UPDM 1.0 Approved Dec 2008**: 2009
- **Scope of UPDM 2.0 Starting June 2009**: 2009

- **DoDAF v1.0**: 1996
- **MODAF v1.0**: 2003
- **C4ISR Architecture Framework** v1.0: 1996
- **DoDAF v1.0**: 1997
**Why: Benefits of a Standard Profile**

- DoDAF v1.5 Volume II provides guidance on using UML
- Based on UML 1.x which has been superseded by UML 2 and SysML
- UML is used extensively to represent DoDAF architecture products across industry; however, UML alone lacks the semantics, constraints and rules to ensure a well-formed model.
- UPDM will provide a rigorous model leading to architecture modeling precision and architecture data exchange
When: UPDM 1.0 Roadmap

- Submission – Sept 2008
- OMG vote to adopt UPDM Dec 2008
  - Start of FTF process
- Completion of FTF/UPDM 1.0 June 2009
- Adoption of UPDM Sept 2009
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

- Integrate 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
• Package structure organizes stereotypes by viewpoint
• Multiple viewpoints manage model complexity
UPDM - Profile Example
OV-1: Operational Context Graphic

This view sets the scene by illustrating the search and rescue operation at sea which involves a yacht in distress. A monitoring unit picks up the distress calls of the yacht and passes them to a Command and Control (C2) centre which coordinates the operation involving helicopters, a naval ship and a RNLI Lifeboat.
OV-5 Activity Diagram
SV-1: Resource Interaction Specification

This view defines the structure and internal flows of the Capability Configuration. The figure shows the Capability Configuration of a Maritime Rescue Unit. It is comprised of the Maritime Rescue Team (MRT), and the roles that make up the MRT, as well as the components that enable them to fulfill their role. This example shows that the Role of Driver is filled by a MRT Member who must interact with a MR Boat.
SysML Example: AV-3

Definition of the required measurements

AV [Architectural Description] Measurements [Class]

«MeasurementSet»
«valueType»
Standard SAR Measurements
- «Measurement» areaCoverage : Coverage
- «Measurement» findTime : Elapsed Time
- «Measurement» persistence : Elapsed Time
- «Measurement» searchCoverage : Coverage
- «Measurement» weatherConditions : Weather Conditions

«MeasurementSet»
«valueType»
Maritime SAR Measurements
- «Measurement» seaConditions : Sea State

«MeasurementSet»
«valueType»
Land SAR Measurements
- «Measurement» terrain : Terrain Type
SysML Example: StV-2

Maritime SAR can be characterized in terms of the length of a Maritime SAR operation, the sea conditions in which Maritime SAR must be deliverable, the search area covered by an operation and the time to find a victim.
SysML Example: Parametric Diagram

- Parametric diagram allowing trade-off analysis
When: UPDM 2.0 Roadmap

• Signed and Released DoDAF 2.0 anticipated in June 2009
• Preparation of RFP for UPDM 2.0 (Next Slide)
• Issue UPDM 2.0 RFP Sept 2009
• ....
When: UPDM 2.0 Roadmap

- Preparation of RFP for UPDM 2.0
  - Inclusion of DoDAF 2.0
  - Support for NAF 3
  - Information and Security views from DNDAF
  - Human Factors Views based on MODAF and DNDAF
  - Business Motivational Modeling/SBVR profile integration
  - Business process Modeling Notation
    - UPDM v2 optionally could use BPMN to model operational views
  - Others?
Discussion

Questions?
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