

Introduction to UPDM™

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Introduction

UPDM™ is the Unified Profile for DoDAF (Department of Defence Architectural Framework) and MODAF (Ministry of Defence Architectural Framework). MoDAF is based upon DoDAF but is much more formally defined and has more views and viewpoints (Adds a Strategic View and an Acquisition View) than DoDAF (All View, Operational View, Systems and Services Views and a Technical View). In its current version, UPDM 1.0, it officially supports DoDAF 1.5 and MODAF 1.2, unofficially it can be used for DoDAF 2.0 work as it supports the DoDAF 2.0 views. Work is being carried out in the OMG on UPDM 2.0, this will officially support DoDAF 2.0.x, MODAF 1.2.x and NAF 3.1. This is due to be released in mid 2011.

The profile defines a standard set of elements, the relationships that exist between them and a number of Views and Viewpoints that are used to support the development of Enterprise Architectures for primarily the Military domain. UPDM can also be used for the general business and public service domains as a number of public companies and government organisations have also used MODAF to understand their enterprises.

UPDM was developed for a number of reasons, the main ones being

- A. To provide a common metamodel for DoDAF and MODAF to enable interoperability of architectures across international program boundaries
- B. To provide a common terminology (where possible) for the core concepts of both architectural frameworks
- C. To provide a common means of tool interchange via XMI for UPDM architectures
- D To enable Enterprise Architects to develop architectures at a high level of abstraction in a consistent way that can be taken down through systems to software in the same underlying modelling language (UML, SysML and SOAML)
 - D.1 Enables Architects to discuss with tier one suppliers their stakeholder needs and requirements at the operational and systems level.
 - D.2 For tier one suppliers it enables the further development of these stakeholders needs into Systems and software requirements that are either handed off internally or passed to subcontractors.

It should be noted that UPDM is not the definition of a new Architectural Framework it is a UML/SysML/SOAML specification for the existing frameworks.

The UPDM development process

Before the UPDM profile was developed it was first necessary to understand the concepts in the architecture and the relationships that existed between those concepts without thinking about implementation. This was the role of the Domain MetaModel or DMM. The DMM in effect providing the requirements or specification for the profile.

The UPDM DMM was heavily based upon the existing MODAF 1.2 metamodel, of the time, as it was more formal than DoDAF and already had a UML profile associated with it.

The DMM was expressed using notation from the International Defence Enterprise Architecture Specification Group (IDEAS, <http://www.ideasgroup.org/1Overview/>) that defined elements in terms of Types, Individuals and Tuples, that closely map to Classes/Blocks, Instances/Parts and forms of dependency or association in UML/SysML. The DMM from which the UPDM profile was derived from can be seen in the UPDM specification and, following good system engineering practice, all elements in the profile were traced to elements in the DMM using Satisfy relationships. This helped to ensure complete coverage of the DMM and that all the elements in the profile were required to implement an aspect of the DMM.

UPDM Compliance levels and use of other Standards

Due to the large scope of the profile from high level program and portfolio management down to Systems specification the profile although primarily based upon UML but it also incorporates aspects of SOAML (Service Orientated Architecture Modelling Language) and SysML. UPDM L0 and L1 shown in the venn diagram below indicated two levels of compliance. L0 is based upon UML and SOAML, whilst L1 also uses elements of SysML. See fig 1 below.

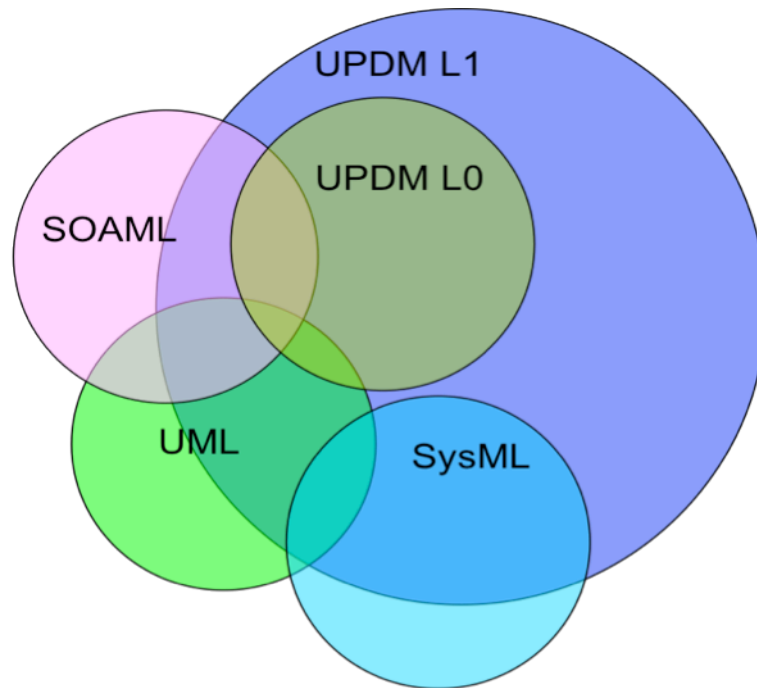


Figure 1 Venn diagram showing the mapping of OMG Standards onto UPDM

The use of SysML in UPDM

In Level 1 the complete SysML is imported into UPDM, see figure 2 below but only some of the UPDM elements are modified to extend SysML elements. This mapping was done where it seemed the semantically correct to use the SysML elements rather than take a blanket approach to map everything to SysML.

Examples of the use of SysML in UPDM are

Blocks:- These are used to represent elements such as Nodes, OperationalNodes, System, Software etc, and other resources. These are elements that are extensions of Class in L0. It should be noted that not all UPDM elements that extend class in L0 are extensions of Blocks in L1.

Item Flows:- These are used to map to all the elements which were originally based on InformationFlows in L0, examples being InformationExchange, MaterielExchange and ResourceInteraction.

FlowPorts:- These are used to represent all the interaction points that are extensions of Ports in L0, examples being NodePort and ResourcePort.

ValueTypes:- These are used to represent certain types element in UPDM that can be represented as DataTypes in the L0, examples being LightCondition and PhysicalLocation.

For more detailed information on this mapping refer to section 8.1 of the UPDM 1.0 specification.

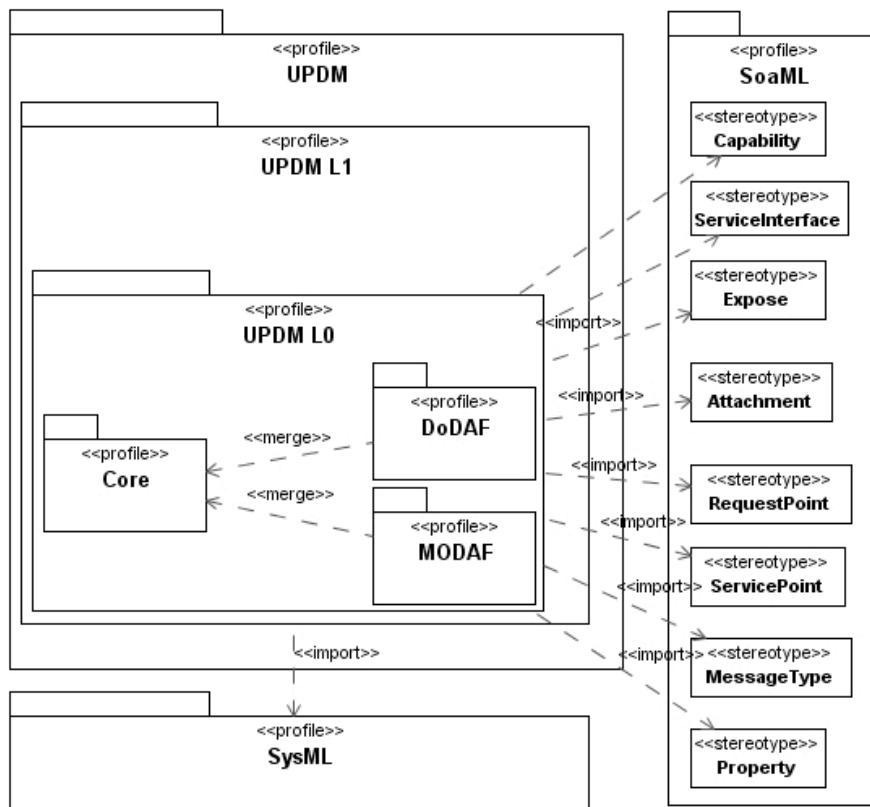


Figure 2 UPDM Package diagram