



OBJECT MANAGEMENT GROUP ®

## Modeling Language Standards at OMG

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Modeling is the process of abstracting from reality. By choosing an appropriate level of abstraction, a modeler can focus concentration on chosen aspects and features of a design without interference from irrelevant details. Modeling supports focused views onto a system, allowing, e.g., business people to focus on business process aspects, while system architects focus on requirements, use cases, and system structure. Models are also a powerful communication vehicle, supporting the construction of complex interoperable systems from subsystems contributed by different organizations. This gives a whole new meaning to Enterprise Architecture, makes service-oriented systems work, and enables the construction of those complex real-time processing networks now ubiquitous in most vehicles from off-the-shelf cars to high-performance aircraft. The size and complexity of modern systems has turned modeling from a convenience into a necessity. The generation of software implementations from their corresponding models – or the execution of the models themselves – makes modeling the development paradigm of the present and the future.

The modeling languages standardized by the Object Management Group® are based on a formal foundation. As part of the Model Driven Architecture® (MDA®) framework, they provide the platform for implementation generation, and for the development of domain-specific models and modeling languages. Their common root in the Meta Object Facility (MOF™) provides an unparalleled level of flexibility and interoperability.

The strong worldwide industry adoption of OMG® modeling languages and domain standards confirms their significance and usefulness. The following sections provide a brief synopsis of the OMG family of standardized modeling facilities.

### OMG Standards for Business Modeling

The Business Motivation Model (BMM) provides a framework for strategic planning as the basis of enterprise motivation. The Semantics of Business Vocabulary and Business Rules (SBVR™) supports the specification of multiple vocabularies and formal logic in controlled natural languages, to unambiguously express business concepts for understanding by both humans and computers. The Value Delivery Modeling Language (VDML™) specification provides business design models for managers that fill the gap between strategic planning and business operational design. The Business Process Maturity Model (BPMM) defines standard criteria for assessment of an organization's maturity for business process management.

OMG has developed a “BPM Trilogy” for business process modelling. BPMN™ 2 is the language of choice for business people modeling business processes. The language provides the capability to build process models that are unambiguously translatable into integrated applications. Case Management Model and Notation (CMMN) is a complement to BPMN for modeling unstructured business processes where the activities are driven by the collaborating participants and the evolving state of a case. Decision Model and Notation (DMN™) is a standard for Decision Tables and other models that bridge the gap between the business decision design and decision implementation. DMN is designed for use in combination with and integrated with BPMN and CMMN.

## Semantic Modeling

At present, many industry domains step up from pure structural modeling such as traditional class models, to semantic modeling where behavior and relationships within an environment play a dominant role. The Ontology Definition Metamodel (ODM) bridges between MOF/UML and the Web Ontology Language (OWL), Common Logic, and other logic notations. It is used to define the Financial Industry Business Ontology (FIBO®), a large ontology jointly developed by OMG and the EDM Council. Another OMG standard is the Common Terminology Services 2™ (CTS2™).

## Systems Engineering

OMG standards cover modeling of the entire systems engineering lifecycle from requirements through design, to production and testing with the Systems Modeling Language (OMG SysML®), and the UML Testing Profile (UTP). They are complemented by the Requirements Interchange Format (ReqIF) and the Software Process Engineering Metamodel (SPEM).

## Enterprise Architecture

Enterprise Architecture is a wide field; accordingly OMG standards address it at various levels. The Common Warehouse Metamodel (CWM™) and Information Management Metamodel (IMM, in process) address data modeling in all major modes: relational, object-oriented, multidimensional, record-oriented, XML-based, E-R, and more, including support for OLAP and data mining. Important standards on structural level are the UML Profile for Enterprise Distributed Object Computing (EDOC) and Service-Oriented Architecture Modeling Language (SoaML®), a UML extension. Finally, there is the overarching Unified Profile for DoDAF and MODAF (UPDM™), a UML profile unifying these two powerful enterprise architecture frameworks. UPDM 2.0 was recently added to the US DoD IT Standards Registry (DISR) 12-1.0, where it is mandated for suitable projects.

## About OMG

The Object Management Group® (OMG®) is an international, open membership, not-for-profit computer industry standards consortium. OMG Task Forces develop enterprise integration standards for a wide range of technologies and an even wider range of industries. OMG's modeling standards enable powerful visual design, execution and maintenance of software and other processes. Visit **[www.omg.org](http://www.omg.org)** for more information.

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## Real-time, Embedded, and Mission-Critical Systems

Today's typical high-end automobile may contain sixty, one hundred, or perhaps even more networked computers working together in real-time; a jet airplane (whether military or commercial) or ship contains many more. Modeling is essential to analyze, design, and implement such a system. The UML Profile for Modeling and Analysis of Real-Time and Embedded Systems (MARTE) and the executable subset of UML (fUML™) provide the road to fully-automated system production.

## Metamodeling and Why It's Important

All of the OMG modeling languages and profiles share the Meta Object Facility (MOF) as their common foundation. This enables model exchange using the OMG XML Model Interchange (XMI®) Format and the model-to-model transformations defined in the OMG Query, View and Transformation (QVT) standard. Most importantly, it enables the Model Driven Architecture®.

## For More Information

Official OMG specifications are both freely available and available free; find the catalog at <http://www.omg.org/> specifications and click through to free downloads of every current and previous version of every specification. Drafts of future specifications are restricted to members only. OMG is an open-membership consortium; you can find out about membership and sign up at <http://www.omg.org/membership>.

## Want to learn more?

We would be happy to discuss how OMG membership would benefit your organization. Please feel free to explore our website at **<http://www.omg.org>** and when you are ready, please contact the Business Development team via e-mail at **[bd-team@omg.org](mailto:bd-team@omg.org)** to get started.