

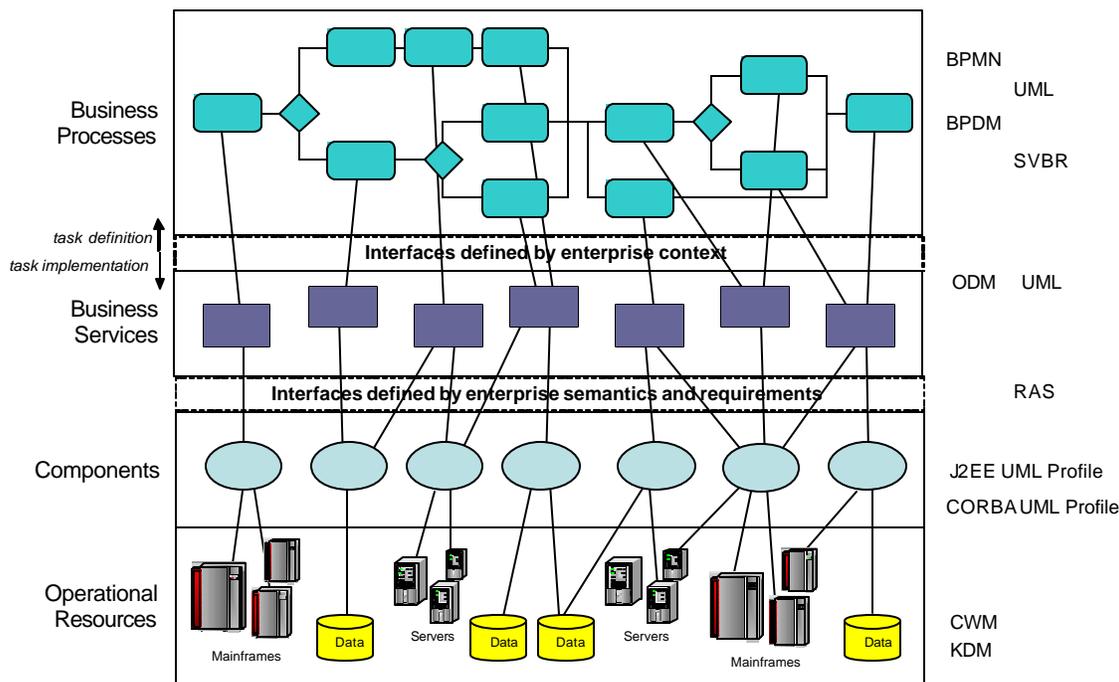


OBJECT MANAGEMENT GROUP

## The OMG and Service Oriented Architecture

Service Oriented Architecture (SOA) represents the best opportunity companies currently have to align their IT resources and business processes and make their systems more agile. There has been a lot of talk about SOA and many different definitions have been proposed. In essence, SOA is an architectural approach that seeks to align business processes with service protocols and the underlying software components and legacy applications that implement them. Both processes and services need to be carefully coordinated to assure an effective SOA implementation. You can't really do SOA without a clear model of the business process to be supported. And you can't link your business processes to your service models without the modeling standards the OMG is developing as part of its Model Driven Architecture® (MDA®).

Figure 1 highlights one way of organizing an SOA environment. The SOA environment is divided into four general layers. The top layer describes business processes made up of a sequence of business activities. The second layer defines business services capable of automating specific business process activities. The third level defines software components and orchestrations that allow the business services to link to and call enterprise-level shared resources as needed. The lowest level illustrates applications, packages and databases that might be called upon by the various components.



**Figure 1. A Service Oriented Architecture. [1]**  
**Some of the OMG MDA Standards that Support SOA are listed on the right in blue.**

Most discussions of SOA focus on specific layers and the protocols and standards used at that specific level. These discussions can be informative, but they miss the big picture. To succeed with SOA, a company needs to understand how to model processes, services, and components and how to tie all the models together in a consistent manner. The OMG's MDA is all about modeling and the management of models – in particular, it addresses concerns of platform independence.

While other organizations have focused on specific standards for integration or web services protocols (e.g., WS-\* standards), the OMG has taken a more platform independent view. Each of the SOA layers can be driven from models. MDA standards offer the capability to design a complete SOA solution through models, and minimize the effort invested in specific technologies or protocols (which are still undergoing very rapid churn). Thus, the main intellectual property can have a long-term life, while the organization is a lot freer to choose the best technical platform based on the current best commercial and technical choices.

Some of the various standards the OMG has developed or are working on are listed on the right side of Figure 1. Those listed focus on the model content; others (not shown) define how the more abstract models can be translated into software designs and code, such as the OMG's Meta Object Facility (MOF™), XML Metadata Interchange (XMI®), Query View & Transformation (QVT) and Model to Text (M2T). These OMG standards provide the overall MDA architecture with its support for automatically moving from one model on one level, to other models on other levels, and to the XMI (the XML Interchange format) that allows all MDA models to be interchanged in a standard manner. Finally the RAS standard allows both services and components to be packaged, catalogued and reused and the SPEM standard allows the definition of SOA-specific software development processes including service development lifecycles, reviews, and roles.

At the Business Process Level, the OMG has adopted the Business Process Modeling Notation (BPMN™), the Semantics of Business Vocabulary and Rules (SBVR), and is working on the Business Process Definition Metamodel (BPDM). The Ontology Definition Metamodel (ODM) provides a means of incorporating the work of the Semantic Web Community (which includes RDF and OWL) into MDA models – in order to define richer semantics for both services and the information interchanged. At the Business Services Level the OMG has defined the Unified Modeling Language™ (UML® 2.0).

Integrating components and legacy applications present a special problem. Good SOA services cannot be achieved by simply exposing legacy applications and data directly. Rather, they need to be transformed to support enterprise semantics. The OMG's Architecture Driven Modernization activities provide an MDA based approach for addressing these challenges: the main standard of relevance here is the Knowledge Discovery Metamodel (KDM). Similarly, MDA metamodels facilitate the modeling of all forms of databases and business intelligence systems, defined using the Common Warehouse Metamodel (CWM™), middleware systems like CORBA®, and programming environments like J2EE. Thus, at the Component and Operational Levels, the OMG has developed a variety of different standards. For example, BPDM has all the information needed to generate BPEL code (and QVT and M2T define standard means to model and tailor the transformations themselves).

Recently a new OMG group, the SOA Special Interest Group, has formed to coordinate SOA efforts within the OMG and between the OMG and other SOA standards groups, including W3C, The Open Group, and OASIS. The SOA SIG will work with other task forces within the OMG to ensure that, as SOA-specific modeling approaches and best practices stabilize, OMG standards are evolved (or new ones commissioned) in order to enable the top-to-bottom, end-to-end modeling of SOAs. Please visit <http://soa.omg.org/> for additional information on the SIG activity.

The current interest in SOA and BPM has already resulted in a proliferation of protocols and tools, many of them incompatible with each other. Predictably, some companies will undertake costly investments in applications and tools that will later prove impossible to maintain or convert to evolving standards. Most organizations want both SOA and agility. That requires a common semantic foundation for all of the models and languages used in SOA, which is exactly what MDA provides, i.e. a 360° perspective of SOA for business and technology stakeholders.

The OMG will emerge as a leading player in SOA by creating the common semantic modeling system made up of specific modeling standards and a common approach to cross-model communication – the Model Driven Architecture, – which assures that future SOA products and applications will be able to talk with one another. That, in turn, provides companies with the flexibility and agility they will need in the years ahead.

-----

[1] This figure is adopted from an article on BPM and SOA, Where Does One End and the Other Begin, by Mike Rosen that appeared on BPTrends in January 2006.