The OMG Business Process Related Standards

An emerging set of standards that enable Model Driven businesses

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Abstract

This document sets out to describe the OMG BPM Business Standards, the rationale behind them and the value that these standards deliver. The key point to understand is that when models are used to manage and drive businesses, the dynamics of competition is affected. Models enable an organization to improve performance more effectively and efficiently over time.

The document sets out to explain and introduce all the standards of the Business Modeling and Integration Domain Task Force (BMI DTF) at the Object Management Group (OMG). It identifies the current status, and immediate plans with regard to each standard and a roadmap going forward.

OMG Value Proposition

The OMG BMI DTF is focused on supporting organizational improvement initiatives through the development of effective standards. These standards cover a wide spectrum of usage—from high-level representations of an organization and its objectives, into methods for structuring the language and jargon of the industry, through to ways of modeling processes and business rules. It also defines standards for the data structures used in Business Process Management (BPM) Suites such that performance optimization and analysis tools can be developed and deployed.

The importance and distinguishing feature of the OMG BPM modeling standards is the Model Driven Architecture (MDA). MDA leverages the Meta Object Facility (MOF) language for the expression of metamodels, i.e. for the specification of modeling languages. As a result, all OMG models have a common foundation—the XML Model Interchange (XMI) format provides a robust mechanism through which MOF-based models can be exchanged.[2]

In the business-modeling domain, these underlying capabilities enable models designed for business people to provide different, complementary perspectives (some of which overlap). In some situations, it allows the modeler to reveal and reconcile inconsistencies between these models. Moreover, robust transformations can enable traceability between business and information systems designs.

Organizations who take advantage of these specifications can better protect their investments in business, process and rule-based models; transforming those models where relevant to drive business processes, and enable organizational performance improvement and long-term agility.

> *Effectively, the firm can now drive its operations with models—change the model and you change the way the business runs.*

Naming of Existing Standards Initiatives

Some believe that the BMI should rename some of its existing initiatives. Currently, there is so much alphabet soup that even seasoned members of the BMI have trouble keeping up with all of the initiatives and how they relate to each other. A new set of names would be more easily recognizable and easier to understand—for the nonprofessional, and the members of the BMI/OMG.

The OMG BPM Business Standards are split across three broad domains – those primarily designed for used in the business community itself (B-*), those with a stronger process orientation (BP-*), and those that relate fundamentally to Business Rules (BR-*).

Business Domain

BMM	B-Motivation
OSM	B-OrgStructure
SBVR	B-Vocabulary
	B-Governance

Business Process Domain

BPMM	BP-Maturity Model
BPMN	BP-Notation
BPDM	BP-Semantics
BPRI	BP-Analysis

Business Rules Domain

PRR	BR-Production Rules

At this point, these names are suggestions only. They still require validation and agreement with the individual standards making efforts.

It is important to note that the OMG BPM Business Standards cover all aspects of business models—including business strategy, motivation, performance improvement, design-time process modeling, business rules and process execution.

Individual Standards Efforts

What follows is an attempt to explain in simple, un-complicated language, the role of each standard in the OMG BPM Business Standards Suite. Each section is designed to be relatively short and simple, explaining the relevance of the standard in business terms. A brief summary of the expected roadmap and time line for each specification follows.

Business Motivation Model (BMM)

Overview

BMM provides a scheme or structure for deciding, documenting, communicating, and managing key elements in the design of the business and their interrelated purposes in an integrated manner. For each element, it identifies all other elements where:

- The design is affected by this element (impact).
- They influenced the design of this element (purpose).

Intended Audience

The primary audiences of the BMM specification are those involved in managing the business (providing a conceptual tool for engineering the business itself), individuals supporting their work (as a tool for organizing and clarifying the design of the business and its documentation), and vendors developing modeling tools and repositories (providing a formal scheme for structuring high-level documentation of business designs).

Functional Use

The underlying assumption is that clarity (in the development and documentation of business designs) enables effective management and direction of the business. A BMM model is primarily about the business, not its information systems.

The core concepts covered are:

- Forces, both internal (corporate value, resources, infrastructure, etc.) and external (environment, regulation, competitor, customer, etc.), that influence the design of the business.

- Assessments made of those influencing forces—i.e. Strengths, Weaknesses, Opportunities, and Threats, and their impact as Risks or Potential Rewards.

- Things that the organization wishes to achieve—for example, its Goals and Objectives.

- The means used to achieve them (Strategies and Tactics), and the Governance principles—its Business Policies and Business Rules.

- The organizational and responsibility structure of business.

- The mechanics of how the business operates—its business processes.

Business designs documented using BMM can become the foundation for other initiatives, ensuring any information system solutions link to their true business intent.

Current Status

BMM is now available for download as an OMG "Adopted Specification". At the time of writing, the approach is being utilized in number of major projects and is also available in an Eclipse-based modeling tool from Xactium (currently in late stage Beta).

Organizational Structure Metamodel (OSM)

Overview

OSM is intended to provide a definitive vocabulary, rules and interchange metamodel for specifying the authority, responsibility and accountability structure of an organization. OSM is a business level specification that provides the potential for BPM Suites and other IT systems to leverage a common, extensible set of data related to organizational units as resources.

Intended Audience

The primary audience for this specification is business managers and staff who must document their organizational structure. Another key audience is the vendors providing organizational modeling tools, and BPM Performance and BPM Suites capabilities (who will leverage these models).

Functional Use

OSM will enable the business level documentation of virtually any sort of organizational form, the organizational units that go to make them up, information about those organizational units, and the relationships to other organizational units. It also includes the ability to identify and contact individuals, document the skills they posses, assign these individuals to organizational positions and roles, specify organizational unit capabilities and assign resources to organizational units. The specification will include at least one mapping to a production directory schema (such as LDAP).

As a result, OSM will further enhance the ability to model business processes independently of the organizations within which they are applied. Moreover, at run time, the BPM Suite will be able to rely on OSM to support routing resolution; ensuring work is delivered to the relevant individual(s). It will also facilitate the analysis of the resources deployed to support organizational activity (business processes). Effectively, that means being able to optimize resources across processes.

Current Status

While the concept was mapped out some time ago, a new work group formed recently to drive this specification forward. It is expected to produce an effective standard by the end of 2007.

Semantics of Business Vocabulary and Business Rules (SBVR)

Overview

SBVR provides two complementary capabilities – Vocabulary definition and support for Governance initiatives.

- The Vocabulary element provides concepts, terminology and rules facilitates that document the special business terminology and business facts used in the operation of an organization. This is independent of the information systems used to support the organization. Concepts are defined independently of the terms or language used to express them, enabling translation from terms in one language to another. The specification also provides constructs that enable linguistic analysis of text documents, facilitating the extraction of business vocabulary and related business rules.

- The Governance component is used to define the concepts, terminology and rules for documenting the business policy and governance principles of an organization. It builds on top of the Vocabulary and uses the same logic structures to specify and state business policy and business rules formally. As a result, the policy/rules are interpretable using formal logic, and therefore accessible to conformant tools to maximize completeness and consistency, while minimizing ambiguity.

In time, it is intended that these two specifications will be separated and managed as distinct entities. For the moment, we will refer to the separate areas of functionality for clarity, although in fact, they are currently part of the same specification.

Intended Audience

The SBVR specification is used by vendors of business vocabulary and business policy/rules management tools. The users of these tools are business specialists who champion the management of the business vocabulary in the area of the business were they work. Such tools may also be used by those concerned with defining Governance frameworks and rules.

The specification provides an XML format to interchange business vocabularies and business policies/rules between compliant tools from different vendors. It also has relevance to software vendors in generating the related information model of the domain they are supporting and understanding the business models applicable to

that domain. It also has relevance to BPM and Rules Engine vendors in generating business rules of a given domain.

Functional Use

At its heart, SBVR (Vocabulary) provides the ability to specify and state definitions formally and unambiguously in terms of other definitions (in the vocabulary). This allows definitions to be interpreted using formal logic, and therefore processed by tools that make use of reasoning capability to maximize completeness and consistency, and minimize ambiguity.

It provides a powerful multi-dimensional, hierarchical categorization capability enabling the organization of concepts from general to specific (often referred to as taxonomies or categorization schemes). It also incorporates *thesauri* mechanisms such as synonyms, abbreviations, "see also", multiple vocabularies for one set of meanings for different languages, etc. The specification also includes support for ISO "multi-lingual thesaurus" standards.

The taxonomies and categorization schemes also support relationships between the concepts contained within them (business facts), facilitating the development of sophisticated search and navigation algorithms that leverage these relationships (Support for the ISO/IEC "Topic Maps" standard is included). The standard also enables the integration of distinct vocabularies through a vocabulary adoption mechanism to minimize the amount of custom vocabulary that has to be created, maintained, and learned.

As such, SBVR plays a strategic role in integrating all the OMG B-* specifications. Whether you are stating an influence, risk, objective, strategy, business policy or describing an organizational element or business process, when you use a term to express any of those that are in the same context, it needs to mean the same thing. SBVR (Vocabulary) provides much of the glue that ties business models created using B-* specifications together.

The Governance aspect separates the meaning of the policy/rule from the potentially multiple ways it is expressed in natural language. Therefore, it is possible to detect different policy/rule statements that share a common meaning, even though they use different words. Moreover, the multilingual capabilities of SBVR enable business policy and operative business rules to be automatically translated from one language and dialect to another.

Current Status

Adopted in Sept 2005, SBVR is going through the later stages of finalization. It is available on the OMG web site here. An open source implementation of SBVR is available here.

Business Process Maturity Model (BPMM)

Overview

The Business Process Maturity Model (BPMM) is a fully developed maturity model that rigorously follows the principles of established SEI process maturity frameworks, e.g. CMMI. BPMM is oriented around the needs of the broader business community rather than the IT project orientation of CMMI and CMM. BPMM was developed to guide improvement of business processes which tend to cross organizational boundaries rather than the IT project oriented focus of CMMI. The BPMM incorporates improvements in coverage, structure, and interpretation developed since the publication of its predecessor maturity models.

BPMM might be though of as describing the *journey* that an organization embarks upon when engaging in a business process driven transformation initiative. It describes the five stages of organizational maturity (in relation to business process) and the behaviors of an organization at that level of maturity.

Intended Audience

There are five primary audiences of users for the BPMM—Enterprise Executives; Line of Business managers/executives; IT executives; Leaders of change initiative, e.g. BPM Centers of Excellence, etc. and BPO evaluation teams.

Functional Use

There are four primary ways in which the BPMM will be used and each will drive different requirements for appraisals:

- **Guiding Business Process Improvement Programs**—BPMM is designed to guide improvement programs. This is anticipated to be its most frequent use. Improvement programs should begin with an evaluation of the organization's current strengths and weaknesses, providing findings sufficient to initiate an improvement program.

- **Assessing Risk in Developing and Deploying Enterprise Applications**—BPMM can identify risks associated with the implementation of systems and provide guidance on the actions required to improve them before deployment.

- **Evaluating the Capability of Suppliers**—Organizations need a trusted and open standard against which to evaluate the capabilities of their vendors in meeting required service level, quality, price, and functionality commitments.

- **Benchmarking**—Management may want to evaluate where they stand relative to the maturity of business processes in their industry segment.

Current Status

At this point, a draft BPMM is published as an official OMG White Paper (in the new parlance of OMG standards this is an "alpha-specification"), on which comments are welcome (here). The BPMM specification was adopted in June 2007 and a "beta-specification" should be available on the OMG site on August 17th 2007. A Finalization Task Force has been chartered with the aim of completing its work before the end of 2007. Interested parties should look into the BPMM Self Assessment tool available here on the BPM Focus site.

Business Process Modeling Notation (BPMN)

Overview

BPMN is a standard, graphical modeling representation of business processes. It has been widely adopted by Business Process Management (BPM) related products – both the Business Process Analysis and Modeling tool vendors and the BPM Suites.

Intended Audience

The primary audience for this standard is the business community (in terms of learning to use the notation and modeling their business processes), the modeling tool vendors and also process execution engines.

Functional Use

BPMN provides an easy to use flow-charting notation that is independent of the implementation environment. The underlying semantics facilitate the translation of business level models into executable models that BPM Suites and workflow engines can understand.

Current Status

BPMN Finalization Task Force presented the final report at the June 07 meeting of the OMG. The fully adopted BPMN 1.1 Specification should be available here by August 07 (an interim version of the specification is available). At the time of writing approximately 50 products have implemented support for BPMN (and we are aware of many more in development).

Business Process Definition Metamodel (BPDM)

Overview

The Business Process Definition Metamodel (BPDM) provides the capability to represent business process models independently of the modeling notation. At the same time, it also provides a robust serialization (storage) mechanism for BPMN.

BPDM sets out to define a shared vocabulary for process modeling concepts; think of it as a sort of "universal syntax" of process. The central idea is that BPDM is capable of supporting most common types of process model and, as much as is possible, enables the robust exchange of models while preserving the intended enactment and execution semantics. To achieve this goal, the heart of BPDM supports two fundamentally complementary views of process – "Orchestration" and "Choreography":

- Orchestration concepts in BPDM are represented through "Process," which includes the traditional view where sequences of "Activity" are carried out, with branching and synchronization of different threads (sometimes known as managed or directed execution).

- Choreography is a more abstract notion of process (for most people). It describes the "Interactions" of collaborating entities, each of which may have their own internal orchestration processes. These Interactions are often structured into "Interaction Protocols" (in the sense that Interactions usually have an order) to represent the conversation between the parties. These protocols usually exist between both internal organizational roles and external

stakeholders such as other departments, business units, as well as customers, suppliers and regulatory authorities.

In business process modeling, choreography and orchestration are effectively two sides of the same coin. In BPDM the "Common Behavior Model," allows them to be treated independently, yet enables the sharing of common information (about business being modeled). At its core, BPDM provides interoperability across tools, so that different tools can depict a process in different ways.

Target Audience

BPDM is a technology-oriented specification for vendors defining how they exchange process models, enabling for broad industry interoperability. For most business analysts and process users, this is all they really need to know about BPDM. As long as Vendor A and Vendor B both use BPDM as their process serialization (exchange format) mechanism, then, a BPMN drawing created using Vendor A's modeling tool could be opened and executed using Vendor B's BPM Suite.

Functional Use

Supporting both orchestration and choreography is critical to modern organizations as the business boundaries change ever more quickly. It is self evident that businesses are constantly reorganizing, merging and splitting their operations, resulting in continuous changes in both the internal boundaries, and that which what owned or outsourced to both collaborators (in the supply chain) and the customer. Yet there is still a common process operating across the value chain. BPDM facilitates this evolving, permeable boundary by identifying and managing the common elements, enabling the modeler to easily transition between them.

Because of this sophistication, it supports a very wide range of usage scenarios. For example, it enables high level, abstract "business capability models" used in the boardroom, to exchange information with lower level, procedural modeling notations used in BPM projects, and then on into process execution (BPM Suites).

BPDM will facilitate the definition of complex inter-company (and intra-company) business protocols (i.e. choreography). Such models could be defined directly, or created through the composition of existing protocol fragments (from a library). The resulting model can then provide the terms of reference for each participants' own internal orchestration model. In turn, this orchestration model could be teased apart to explore the business protocols that exist between the internal participants (internal roles) and/or used to generate a robust BPEL execution model that directly supported the agreed choreography between the companies.

It is important to realize that these fundamentally different perspectives (views) of a process are based on distinct, yet related sets of semantic information. The key point is that if these subtle differences are captured and mapped appropriately, then it becomes possible to effectively manage change—even down to capturing different scenarios, what-if analysis information and enabling rollback to previous versions.

In its initial form, a primary benefit of BPDM is the provision of a standard format for exchange of BPMN models. Work has already begun to develop a UML mapping, and a BPEL translation will be detailed in the appendices of the proposed standard.

Current Status

BPDM was adopted at the March 07 meeting of the OMG. A Finalization Task Force has been formed to identify and resolve any issues with the specification. A BPDM Beta Specification will be made available on the OMG site by the end of July 07. A copy of the specification is available here (the working site of the submission group).

Business Process Runtime Interface (BPRI)

Overview

BPRI is designed to provide a common data model interface for the information used at process execution (individual BPMS products are free to use whatever internal data model they want). While it complements the design time modeling standards of BPMN and BPDM, reusing their functionality where relevant, the primary objective is to facilitate analysis and business performance improvement. In support of this aim, BPRI will incorporate mechanisms for extensibility into the Line of Business (LOB) data of the domain (sometimes referred to as process relevant data).

Target Audience

The target consumers for this specification is the vendor community—those focused on process execution (BPM Suites and Workflow Engines), along with vendors who are developing process analysis tools. Users of these products should require compliance by vendors.

Functional Use

As a direct result of a standards-based interface to runtime data, BPRI will facilitate better process metrics and will enable the emergence of specialist products that can help analyze business processes in real time, suggesting improvements and helping Business Analysts in spotting process improvement opportunities. It will facilitate the overlay of business performance information against the design time models used to drive the business process, highlighting such things as variance and, as a result, the level of process maturity (i.e. enabling a direct link to BPMM).

But this is just one way of highlighting the potential for process optimization. The standard will also enable a variety of methods that help firms drive their performance improvement – for example, increasing operating efficiency (resource utilization), cycle time reduction, enhancing customer satisfaction, path analysis, Six Sigma, etc. A consistent run time data interface will also facilitate more effective process monitoring (Business Activity Monitoring).

Although not a core to the specification's current focus, a robust run-time data model will also allow consistent audit data, facilitating performance analysis based on audit information without requiring access to the BPM Suite or workflow tool. It would also aid the development of comprehensive task list management features for end-users.

Current Status

Work is ongoing on the BPRI submission with a joint effort now envisaged with the Workflow Management Coalition (WfMC). The aim is complete the specification by the end of 2007.

Production Rule Representation (PRR)

Overview

The Production Rule Representation specification is designed to standardize the modeling of business rules (production rules representing behavior). Its primary aim is to provide Business Rules Engines (BRE) with a standard interchange format when called by Business Process Management Suites and other decision automation applications.

Intended Audience

The primary audience for this specification is the BRE vendors, and vendors of similar tools providing customized behavior (e.g. BPM Suites). PRR covers both inference and procedural definitions for decision logic, allowing support by tools using both models.

Functional Use

PRR is intended to encourage accelerated adoption of production rule components and/or the business rules approach in everyday software systems by providing a standard metamodel with associated UML definitions. As an extension to UML, software developers can include production rules in their OO models; however the most common use will be design-time rule interchange. PRR is envisaged for design-time use (like UML), and maps to the W3C Rule Interchange Format (RIF) for embedding these production rules in the Semantic Web.

PRR has an XMI format, and is defined in 2 forms:

- PRR Core provides the basic metamodel – rules defined in PRR Core will generally be interchangeable with other PRR Core implementations, but will require translations across condition and action languages.

- PRR OCL provides the metamodel using an extended version of UML OCL to define conditions and actions.

Status

PRR is currently in development by several of the largest market sure rules engine vendors. The current draft is likely to be submitted in September 2007 and will be made public at that time (as an Alpha-Specification).

Road Map

This is a summary of the way ahead for existing standards initiative underway:

Business Domain

- **BMM** – The BMM team will add business/market, product/services, resources, and other key business design elements required to fully document the connections between motivations between their key elements.

- **OSM** – The work should complete before the end of 2007. It will be designed to work closely with BPDM and BPRI.

- **SBVR** – The intention is that the two halves of SBVR be separated such that the distinct audiences can identify more clearly with it. There is also joint work with ISO TC 37 to have then adopted as ISO standards in Q4 2008.

Business Process Domain

- **BPMM** – Once the Finalization Taskforce has completed its work (end 2007), it is intended that BPMM will be updated and refreshed over time.

- **BPMN** – The BPMN 1.1 will be available on the OMG site by August 2007. BPMN 2.0 is a <u>major</u> update to the standard and involves merging BPMN with the BPDM specification. It will extend the notation itself to include notation support for all the elements of BPDM. These extensions will include support for inter-company choreography and related business contracts, as well as higher level modeling constructs used to define the business as a set of independent capabilities or services. BPMN 2.0 has wide support from virtually all major vendors and should be ready sometime toward the end of 2008.

- **BPDM** – see BPMN 2.0 above.

- **BPRI** – BPRI, is working through a submission group now and is expected to be ready by the end of 2007.

Business Rules Domain

- **PRR** – After the initial release of PRR (1.0), version 2 will likely address decision tables and trees, and additional production rule metadata items such as effective dates. In addition, the PRR team will likely consider a more common standard for the rule and action language, allowing interchange with non-UML-based systems.

Conclusion

Although there are a great many business process related standards, the OMG is the only organization working on developing comprehensive support for organizations seeking to drive their operations and thinking with robust models. However, the OMG is conscious of the need to work with, and leverage, existing business process related standards (developed by other organizations).

The underlying sophistication of the OMG MOF Architecture is an essential component in enabling the sort of model interchange demanded by technologists and business people alike. These standards are not designed as a lowest common denominator—they are also about enabling the next wave of business process innovation. Collectively they cover the spectrum of need for organizations engaged in business process transformation; where models are used to drive how the firm operates.

Notes

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[1] The paper was prepared following extensive consultation with by the BPMI Steering Committee (SC)—a group that is driving and influencing the development of a comprehensive framework of BPM related standards within the OMG. The SC also acts as a focal point for interactions with other BPM relevant standards bodies. The document lays out the position of the SC, identifying the rationale and direction of the OMG BMI DTF related standards. This document targets the wider business community (rather than the OMG vendor community).

[2] MDA also defines a language for transformation of models called Query/View/Transformation (QVT). This allows transformation of equivalent modeling concepts between modeling languages that may be designed for different purposes or communities of users. One of the capabilities of QVT is that it enables the transformation of abstract business and technology requirements into a form that is realizable as executable applications.