

Object Management Group

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Business Semantics of Business Rules Request For Proposal

OMG Document: br/2003-06-03

Letters of Intent due: December 8, 2003
Submissions due: January 12, 2004

Objective of this RFP

There is no generally accepted approach for defining or representing business rules. The objective of this RFP is to allow business people to define the policies and rules by which they run their business in their own language, in terms of the things they deal with in the business, and to capture those rules in a way that is clear, unambiguous and readily translatable into other representations. Among those representations are presentation forms for business people and software engineers, and executable rules for many kinds of automated systems.

This RFP solicits proposals for the following:

- a metamodel for the specification of business rules by business people, with a MOF representation;
- a metamodel for the capture of vocabularies and definitions of the terms used in business rules;
- an XML representation of business rules and vocabularies based on XMI that permits exchange among software tools that manage, display, use, and translate business rules.

For further details see Chapter 6 of this document.

1.0 Introduction

1.1 Goals of OMG

The Object Management Group (OMG) is the world's largest software consortium with an international membership of vendors, developers, and end users. Established in 1989, its mission is to help computer users solve enterprise integration problems by supplying open, vendor-neutral portability, interoperability and reusability specifications based on Model Driven Architecture (MDA). MDA defines an approach to IT system specification that separates the specification of system functionality from the specification of the implementation of that functionality on a specific technology platform, and provides a set of guidelines for structuring specifications expressed as models. OMG has established numerous widely used standards such as OMG IDL[IDL], CORBA[CORBA], Realtime CORBA [CORBA], GIOP/IOP[CORBA], UML[UML], MOF[MOF], XMI[XMI] and CWM[CWM] to name a few significant ones.

1.2 Organization of this document

The remainder of this document is organized as follows:

Chapter 2 - *Architectural Context* - background information on OMG's Model Driven Architecture.

Chapter 3 - *Adoption Process* - background information on the OMG specification adoption process.

Chapter 4 - *Instructions for Submitters* - explanation of how to make a submission to this RFP.

Chapter 5 - *General Requirements on Proposals* - requirements and evaluation criteria that apply to all proposals submitted to OMG.

Chapter 6 - *Specific Requirements on Proposals* - problem statement, scope of proposals sought, requirements and optional features, issues to be discussed, evaluation criteria, and timetable that apply specifically to this RFP.

< Note to RFP Editors: Additional RFP-specific chapters may also be included following Chapter 6. If additional chapters are included, please insert brief description of each such chapter here. Insert the additional chapters immediately following Chapter 6, and preceding Appendix A. >

Appendix A – *References and Glossary Specific to this RFP*

< Note to RFP Editors: Please insert any references that are specific to this RFP in section A.1 as per the instructions that appear in that section.

Note to RFP Editors: Please insert any glossary items that are specific to this RFP in section A.2 as per the instructions that appear in that section. >

Appendix B – General References and Glossary

< Note to RFP Editors: Additional RFP-specific appendices may also be included following Appendix B. If additional appendices are included, please insert brief description of each such appendix here. Insert the additional appendices immediately following Appendix B. >

1.3 Contact Information

Questions related to the OMG's technology adoption process may be directed to omg-process@omg.org. General questions about this RFP may be sent to responses@omg.org.

OMG documents (and information about the OMG in general) can be obtained from the OMG's web site (<http://www.omg.org/>). OMG documents may also be obtained by contacting OMG at documents@omg.org. Templates for RFPs (this document) and other standard OMG documents can be found at the OMG *Template Downloads Page* at http://www.omg.org/technology/template_download.htm

2.0 Architectural Context

MDA provides a set of guidelines for structuring specifications expressed as models and the mappings between those models. The MDA initiative and the standards that support it allow the same model specifying business system or application functionality and behavior to be realized on multiple platforms. MDA enables different applications to be integrated by explicitly relating their models; this facilitates integration and interoperability and supports system evolution (deployment choices) as platform technologies change. The three primary goals of MDA are portability, interoperability and reusability.

Portability of any subsystem is relative to the subsystems on which it depends. The collection of subsystems that a given subsystem depends upon is often loosely called the *platform*, which supports that subsystem. Portability – and reusability - of such a subsystem is enabled if all the subsystems that it depends upon use standardized interfaces (APIs) and usage patterns.

MDA provides a pattern comprising a portable subsystem that is able to use any one of multiple specific implementations of a platform. This pattern is repeatedly usable in the specification of systems. The five important concepts related to this pattern are:

1. *Model* - A model is a representation of a part of the function, structure and/or behavior of an application or system. A *representation* is said to be *formal* when it is based on a language that has a well-defined form (“syntax”), meaning (“semantics”), and possibly rules of analysis, inference, or proof for its constructs. The syntax may be graphical or textual. The semantics might be defined, more or less formally, in terms of things observed in the world being described (e.g. message sends and replies, object states and state changes, etc.), or by translating higher-level language constructs into other constructs that have a well-defined meaning. The optional rules of inference define what unstated properties you can deduce from the explicit statements in the model. In MDA, a *representation* that is not *formal* in this sense is not a model. Thus, a diagram with boxes and lines and arrows that is not supported by a definition of the meaning of a box, and the meaning of a line and of an arrow is not a model—it is just an informal diagram.
2. *Platform* – A set of subsystems/technologies that provide a coherent set of functionality through interfaces and specified usage patterns that any subsystem that depends on the platform can use without concern for the details of how the functionality provided by the platform is implemented.
3. *Platform Independent Model (PIM)* – A model of a subsystem that contains no information specific to the platform, or the technology that is used to realize it.
4. *Platform Specific Model (PSM)* – A model of a subsystem that includes information about the specific technology that is used in the realization of that subsystem on a specific platform, and hence possibly contains elements that are specific to the platform.
5. *Mapping* – Specification of a mechanism for transforming the elements of a model conforming to a particular metamodel into elements of another model that conforms to another (possibly the same) metamodel. A mapping may be expressed as associations, constraints, rules, templates with parameters that must be assigned during the mapping, or other forms yet to be determined.

For example, in case of CORBA the platform is specified by a set of interfaces and usage patterns that constitute the CORBA Core Specification [CORBA]. The CORBA platform is independent of operating systems and programming languages. The OMG Trading Object Service specification [TOS] (consisting of interface specifications in OMG Interface Definition Language (OMG IDL)) can

be considered to be a PIM from the viewpoint of CORBA, because it is independent of operating systems and programming languages. When the IDL to C++ Language Mapping specification is applied to the Trading Service PIM, the C++-specific result can be considered to be a PSM for the Trading Service, where the platform is the C++ language and the C++ ORB implementation. Thus the IDL to C++ Language Mapping specification [IDLC++] determines the mapping from the Trading Service PIM to the Trading Service PSM.

Note that the Trading Service model expressed in IDL is a PSM relative to the CORBA platform too. This highlights the fact that platform-independence and platform-specificity are relative concepts.

The UML Profile for EDOC specification [EDOC] is another example of the application of various aspects of MDA. It defines a set of modeling constructs that are independent of middleware platforms such as EJB [EJB], CCM [CCM], MQSeries [MQS], etc. A PIM based on the EDOC profile uses the middleware-independent constructs defined by the profile and thus is middleware-independent. In addition, the specification defines formal metamodels for some specific middleware platforms such as EJB, supplementing the already-existing OMG metamodel of CCM (CORBA Component Model). The specification also defines mappings from the EDOC profile to the middleware metamodels. For example, it defines a mapping from the EDOC profile to EJB. The mapping specifications facilitate the transformation of any EDOC-based PIM into a corresponding PSM for any of the specific platforms for which a mapping is specified.

Continuing with this example, one of the PSMs corresponding to the EDOC PIM could be for the CORBA platform. This PSM then potentially constitutes a PIM, corresponding to which there would be implementation language specific PSMs derived via the CORBA language mappings, thus illustrating recursive use of the Platform-PIM-PSM-Mapping pattern.

Note that the EDOC profile can also be considered to be a platform in its own right. Thus, a model expressed via the profile is a PSM relative to the EDOC platform.

An analogous set of concepts apply to Interoperability Protocols wherein there is a PIM of the payload data and a PIM of the interactions that cause the data to find its way from one place to another. These then are realized in specific ways for specific platforms in the corresponding PSMs.

Analogously, in case of databases there could be a PIM of the data (say using the Relational Data Model), and corresponding PSMs specifying how the data is actually represented on a storage medium based on some particular data storage paradigm etc., and a mapping from the PIM to each PSM.

OMG adopts standard specifications of models that exploit the MDA pattern to facilitate portability, interoperability and reusability, either through ab initio development of standards or by reference to existing standards. Some examples of OMG adopted specifications are:

1. *Languages* – e.g. IDL for interface specification, UML for model specification, OCL for constraint specification, etc.
2. *Mappings* – e.g. Mapping of OMG IDL to specific implementation languages (CORBA PIM to Implementation Language PSMs), UML Profile for EDOC (PIM) to CCM (CORBA PSM) and EJB (Java PSM), CORBA (PSM) to COM (PSM) etc.
3. *Services* – e.g. Naming Service [NS], Transaction Service [OTS], Security Service [SEC], Trading Object Service [TOS] etc.
4. *Platforms* – e.g. CORBA [CORBA].
5. *Protocols* – e.g. GIOP/IIOP [CORBA] (both structure and exchange protocol), [XMI] (structure specification usable as payload on multiple exchange protocols).
6. *Domain Specific Standards* – e.g. Data Acquisition from Industrial Systems (Manufacturing) [DAIS], General Ledger Specification (Finance) [GLS], Air Traffic Control (Transportation) [ATC], Gene Expression (Life Science Research) [GE], Personal Identification Service (Healthcare) [PIDS], etc.

For an introduction to MDA, see [MDAa]. For a discourse on the details of MDA please refer to [MDAc]. To see an example of the application of MDA see [MDAb]. For general information on MDA, see [MDAd].

Object Management Architecture (OMA) is a distributed object computing platform architecture within MDA that is related to ISO's Reference Model of Open Distributed Processing RM-ODP[RM-ODP]. CORBA and any extensions to it are based on OMA. For information on OMA see [OMA].

3.0 Adoption Process

3.1 Introduction

OMG adopts specifications by explicit vote on a technology-by-technology basis. The specifications selected each satisfy the architectural vision of MDA. OMG bases its decisions on both business and technical considerations. Once a

specification adoption is finalized by OMG, it is made available for use by both OMG members and non-members alike.

Request for Proposals (RFP) are issued by a *Technology Committee* (TC), typically upon the recommendation of a *Task Force* (TF) and duly endorsed by the *Architecture Board* (AB).

Submissions to RFPs are evaluated by the TF that initiated the RFP. Selected specifications are *recommended* to the parent TC after being *reviewed* for technical merit and consistency with MDA and other adopted specifications and *endorsed* by the AB. The parent TC of the initiating TF then votes to *recommend adoption* to the OMG Board of Directors (BoD). The BoD acts on the recommendation to complete the adoption process.

For more detailed information on the adoption process see the *Policies and Procedures of the OMG Technical Process* [P&P] and the *OMG Hitchhiker's Guide* [Guide]. In case of any inconsistency between this document and the [P&P] in all cases the [P&P] shall prevail.

3.2 Steps in the Adoption Process

A TF, its parent TC, the AB and the Board of Directors participate in a collaborative process, which typically takes the following form:

- *Development and Issuance of RFP*

RFPs are drafted by one or more OMG members who are interested in the adoption of a standard in some specific area. The draft RFP is presented to an appropriate TF, based on its subject area, for approval and recommendation to issue. The TF and the AB provide guidance to the drafters of the RFP. When the TF and the AB are satisfied that the RFP is appropriate and ready for issuance, the TF recommends issuance to its parent TC, and the AB endorses the recommendation. The TC then acts on the recommendation and issues the RFP.

- *Letter of Intent (LOI)*

A Letter of Intent (LOI) must be submitted to the OMG signed by an officer of the member organization, which intends to respond to the RFP, confirming the organization's willingness to comply with OMG's terms and conditions, and commercial availability requirements. (See section 4.3 for more information.). In order to respond to an RFP the respondent must be a member of the TC that issued the RFP.

- *Voter Registration*

Interested OMG members, other than Trial, Press and Analyst members may participate in specification selection votes in the TF for an RFP. They may need to register to do so, if so stated in the RFP. Registration ends on a specified date, 6 or more weeks after the announcement of the registration period. The registration closure date is typically around the time of initial submissions. Member organizations that have submitted an LOI are automatically registered to vote.

- *Initial Submissions*

Initial Submissions are due by a specified deadline. Submitters normally present their proposals at the first meeting of the TF after the deadline. Initial Submissions are expected to be complete enough to provide insight on the technical directions and content of the proposals.

- *Revision Phase*

During this time submitters have the opportunity to revise their Submissions, if they so choose.

- *Revised Submissions*

Revised Submissions are due by a specified deadline. Submitters again normally present their proposals at the next meeting of the TF after the deadline. (Note that there may be more than one Revised Submission deadline. The decision to extend this deadline is made by the registered voters for that RFP.)

- *Selection Votes*

When the registered voters for the RFP believe that they sufficiently understand the relative merits of the Revised Submissions, a selection vote is taken. The result of this selection vote is a recommendation for adoption to the TC. The AB reviews the proposal for MDA compliance and technical merit. An endorsement from the AB moves the voting process into the issuing Technology Committee. An eight-week voting period ensues in which the TC votes to recommend adoption to the OMG Board of Directors (BoD). The final vote, the vote to adopt, is taken by the BoD and is based on technical merit as well as business qualifications. The resulting draft standard is called the *Adopted Specification*.

- *Business Committee Questionnaire*

The submitting members whose proposal is recommended for adoption need to submit their response to the BoD Business Committee Questionnaire [BCQ] detailing how they plan to make use of and/or make the resulting standard available in products. If no organization commits to make use of the

standard, then the BoD will typically not act on the recommendation to adopt the standard. So it is very important to fulfill this requirement.

- *Finalization*

A Finalization Task Force (FTF) is chartered by the TC that issued the RFP, to prepare an *adopted* submission for publishing as a formal, publicly available specification. Its responsibility includes production of one or more prototype implementations and fixing any problems that are discovered in the process. This ensures that the final available standard is actually implementable and has no show-stopping bugs. Upon completion of its activity the FTF recommends adoption of the resulting draft standard called the *Available Specification*. The FTF must also provide evidence of the existence of one or more prototype implementations. The parent TC acts on the recommendation and recommends adoption to the BoD. OMG Technical Editors produce the *Formal Published Specification* document based on this *Available Specification*.

- *Revision*

A Revision Task Force (RTF) is normally chartered by a TC, after the FTF completes its work, to manage issues filed against the *Available Specification* by implementers and users. The output of the RTF is a revised specification reflecting minor technical changes.

3.3 Goals of the evaluation

The primary goals of the TF evaluation are to:

- Provide a fair and open process
- Facilitate critical review of the submissions by members of OMG
- Provide feedback to submitters enabling them to address concerns in their revised submissions
- Build consensus on acceptable solutions
- Enable voting members to make an informed selection decision

Submitters are expected to actively contribute to the evaluation process.

4.0 Instructions for Submitters

4.1 OMG Membership

To submit to an RFP issued by the Platform Technology Committee the submitter or submitters must be either Platform or Contributing members on the date of the submission deadline, while for Domain Technology RFPs the submitter or submitters must be either Contributing or Domain members. Submitters sometimes choose to name other organizations that support a submission in some way; however, this has no formal status within the OMG process, and for OMG's purposes confers neither duties nor privileges on the organizations thus named.

4.2 Submission Effort

An RFP submission may require significant effort in terms of document preparation, presentations to the issuing TF, and participation in the TF evaluation process. Several staff months of effort might be necessary. OMG is unable to reimburse submitters for any costs in conjunction with their submissions to this RFP.

4.3 Letter of Intent

A Letter of Intent (LOI) must be submitted to the OMG Business Committee signed by an officer of the submitting organization signifying its intent to respond to the RFP and confirming the organization's willingness to comply with OMG's terms and conditions, and commercial availability requirements. These terms, conditions, and requirements are defined in the *Business Committee RFP Attachment* and are reproduced verbatim in section 4.4 below.

The LOI should designate a single contact point within the submitting organization for receipt of all subsequent information regarding this RFP and the submission. The name of this contact will be made available to all OMG members. The LOI is typically due 60 days before the deadline for initial submissions. LOIs must be sent by fax or paper mail to the "RFP Submissions Desk" at the main OMG address shown on the first page of this RFP.

Here is a suggested template for the Letter of Intent:

This letter confirms the intent of <__organization required__> (the organization) to submit a response to the OMG <__RFP name required__> RFP. We will grant OMG and its members the right to copy our response for review purposes as specified in section 4.7 of the RFP. Should our response be adopted by OMG we will comply with the OMG Business Committee terms set out in section 4.4 of the RFP and in document omg/02-04-02.

<____contact name and details required____> will be responsible for liaison with OMG regarding this RFP response.

The signatory below is an officer of the organization and has the approval and authority to make this commitment on behalf of the organization.

<__signature required____>

4.4 Business Committee RFP Attachment

This section contains the text of the Business Committee RFP attachment concerning commercial availability requirements placed on submissions. This attachment is available separately as an OMG document omg/2002-04-02.

Commercial considerations in OMG technology adoption

A1 Introduction

OMG wishes to encourage rapid commercial adoption of the technologies (specifications and support measures) it publishes. To this end, there must be neither technical, legal nor commercial obstacles to their implementation. Freedom from the first is largely judged through technical review by the relevant OMG Technology Committees; the second two are the responsibility of the OMG Business Committee. The BC also looks for evidence of a commitment by a submitter to the commercial success of products based on the submission.

A2 Business Committee evaluation criteria

A2.1 Viable to implement across platforms

While it is understood that final candidate OMG submissions often combine technologies before they have all been implemented in one system, the Business Committee nevertheless wishes to see evidence that each major feature has been implemented, preferably more than once, and by separate organizations. Pre-product implementations are acceptable. Since use of OMG specifications should not be dependent on any one platform, cross-platform availability and interoperability of implementations should be also be demonstrated.

A2.2 Commercial availability

In addition to demonstrating the existence of implementations of the specification, the submitter must also show that products based on the specification are commercially available, or will be within 12 months of the date when the specification was recommended for adoption by the appropriate Task Force. Proof of intent to ship product within 12 months might include:

- *A public product announcement with a shipping date within the time limit.*
- *A prototype implementation and accompanying draft user documentation.*

Alternatively, and at the Business Committee's discretion, submissions may be adopted where the submitter is not a commercial software provider, and therefore will not make implementations commercially available. However, in this case the BC will require concrete evidence of two or more independent implementations of the specification being used by end-user organizations as part of their businesses.

Regardless of which requirement is in use, the submitter must inform the OMG of completion of the implementations when commercially available.

In the case of the proposed adoption of support measures, the BC needs to have proof of the intent to use or recommend such support measures within 12 months of the date when the support measures were recommended for adoption by the appropriate Task Force.

A2.3 Access to Intellectual Property Rights

OMG will not adopt a specification or support measure if OMG is aware of any submitter, member or third party which holds a patent, copyright or other intellectual property right (collectively referred to in this policy statement as "IPR") which might be infringed by implementation or recommendation of such specification or support measure, unless OMG believes that such IPR owner will grant a license to organizations (whether OMG members or not) on non-discriminatory and commercially reasonable terms which wish to make use of the specification or support measure. Accordingly, the submitter must certify that it is not aware of any claim that the specification or support measure infringes any IPR of a third party or that it is aware and believes that an appropriate non-discriminatory license is available from that third party. Except for this certification, the submitter will not be required to make any other warranty, and specifications will be offered by OMG for use "as is". If the submitter owns IPR to which an use of a specification or support measure based upon its submission would necessarily be subject, it must certify to the Business Committee that it will make a suitable license available to any user on non-discriminatory and commercially reasonable terms, to permit development and commercialization of an implementation that includes such IPR.

It is the goal of the OMG to make all of its technology available with as few impediments and disincentives to adoption as possible, and therefore OMG strongly encourages the

submission of technology as to which royalty-free licenses will be available. However, in all events, the submitter shall also certify that any necessary license will be made available on commercially reasonable, non-discriminatory terms. The submitter is responsible for disclosing in detail all known restrictions, placed either by the submitter or, if known, others, on technology necessary for any use of the specification or support measure.

A2.4 Publication of the specification

Should the submission or support measures be adopted, the submitter must grant OMG (and its sublicensees) a worldwide, royalty-free license to edit, store, duplicate and distribute both the specification and works derived from it (such as revisions and teaching materials). This requirement applies only to the written specification, not to any implementation of it.

A2.5 Continuing support

The submitter must show a commitment to continue supporting the technology underlying the specification or support measure after OMG adoption, for instance by showing the BC development plans for future revisions, enhancement or maintenance.

4.5 Responding to RFP items

4.5.1 Complete proposals

A submission must propose full specifications for all of the relevant requirements detailed in Chapter 6 of this RFP. Submissions that do not present complete proposals may be at a disadvantage.

Submitters are highly encouraged to propose solutions to any optional requirements enumerated in Chapter 6.

4.5.2 Additional specifications

Submissions may include additional specifications for items not covered by the RFP that they believe to be necessary and integral to their proposal. Information on these additional items should be clearly distinguished.

Submitters must give a detailed rationale as to why these specifications should also be considered for adoption. However submitters should note that a TF is

unlikely to consider additional items that are already on the roadmap of an OMG TF, since this would pre-empt the normal adoption process.

4.5.3 Alternative approaches

Submitters may provide alternative RFP item definitions, categorizations, and groupings so long as the rationale for doing so is clearly stated. Equally, submitters may provide alternative models for how items are provided if there are compelling technological reasons for a different approach.

4.6 Confidential and Proprietary Information

The OMG specification adoption process is an open process. Responses to this RFP become public documents of the OMG and are available to members and non-members alike for perusal. No confidential or proprietary information of any kind will be accepted in a submission to this RFP.

4.7 Copyright Waiver

If a submitted document is copyrighted, a waiver of copyright for unlimited duplication by the OMG is required to be stated in the document. In addition, a limited waiver of copyright is required that allows each OMG member to make up to fifty (50) copies of the document for review purposes only.

4.8 Proof of Concept

Submissions must include a “proof of concept” statement, explaining how the submitted specifications have been demonstrated to be technically viable. The technical viability has to do with the state of development and maturity of the technology on which a submission is based. This is not the same as commercial availability. Proof of concept statements can contain any information deemed relevant by the submitter; for example:

“This specification has completed the design phase and is in the process of being prototyped.”

“An implementation of this specification has been in beta-test for 4 months.”

“A named product (with a specified customer base) is a realization of this specification.”

It is incumbent upon submitters to demonstrate to the satisfaction of the TF managing the evaluation process, the technical viability of their proposal. OMG will favor proposals based on technology for which sufficient relevant experience has been gained.

4.9 Format of RFP Submissions

This section provides guidance on how to structure a RFP submission.

4.9.1 General

- Submissions that are concise and easy to read will inevitably receive more consideration.
- Submitted documentation should be confined to that directly relevant to the items requested in the RFP. If this is not practical, submitters must make clear what portion of the documentation pertains directly to the RFP and what portion does not.

4.9.2 Required Outline

A three-part structure for submissions is required. Part II is normative, representing the proposed specification. Parts I and III are non-normative, providing information relevant to the evaluation of the proposed specification.

PART I

- Copyright Waiver (see 4.7)
- Submission contact point (see 4.3)
- Overview or guide to the material in the submission
- Overall design rationale (if appropriate)
- Statement of proof of concept (see 4.8)
- Resolution of RFP requirements and requests

Explain how the proposal satisfies the specific requirements and (if applicable) requests stated in Chapter 6. References to supporting material in Part II should be given.

In addition, if the proposal does not satisfy any of the general requirements stated in Chapter 5, provide a detailed rationale.

- Responses to RFP issues to be discussed

Discuss each of the “Issues To Be Discussed” identified in Chapter 6.

PART II

- Proposed specification

- Proposed compliance points

Submissions should propose appropriate compliance points for implementations.

PART III

- Summary of requests versus requirements.

Submissions must clearly distinguish requirements that all implementations must support from RFP requests that may be optionally supported.

- Changes or extensions required to adopted OMG specifications

Submissions must include a full specification of any changes or extensions required to existing OMG specifications. This should be in a form that enables “mechanical” section-by-section revision of the existing specification.

4.10 How to Submit

Submitters should send an electronic version of their submission to the *RFP Submissions Desk* (omg-documents@omg.org) at OMG Headquarters by 5:00 PM U.S. Eastern Standard Time (22:00 GMT) on the day of the Initial and Revised Submission deadlines. Acceptable formats are Postscript, ASCII, PDF, Adobe FrameMaker, Microsoft Word, and WordPerfect. However, it should be noted that a successful (adopted) submission must be supplied to OMG’s technical editors in FrameMaker source format, using the most recent available OMG submission template (see [FORMS]). The AB will not endorse adoption of any submission for which appropriately formatted FrameMaker sources are not available; it may therefore be convenient to prepare all stages of a submission using this template.

Submitters should make sure they receive electronic or voice confirmation of the successful receipt of their submission. Submitters should be prepared to send a single hardcopy version of their submission, if requested by OMG staff, to the attention of the “RFP Submissions Desk” at the main OMG address shown on the first page of this RFP.

5.0 General Requirements on Proposals

5.1 Requirements

- 5.1.1 Submitters are encouraged to express models via OMG modeling languages such as UML, MOF, CWM and SPEM (subject to any further constraints on the types

of the models and modeling technologies specified in Chapter 6 of this RFP). Submissions containing models expressed via OMG modeling languages shall be accompanied by an OMG XMI [XMI] representation of the models (including a machine-readable copy). A best effort should be made to provide an OMG XMI representation even in those cases where models are expressed via non -OMG modeling languages.

- 5.1.2 Chapter 6 of this RFP specifies whether PIM(s), PSM(s), or both are being solicited. If proposals specify a PIM and corresponding PSM(s), then the rules specifying the mapping(s) between the PIM and PSM(s) shall either be identified by reference to a standard mapping or specified in the proposal. In order to allow possible inconsistencies in a proposal to be resolved later, proposals shall identify whether the mapping technique or the resulting PSM(s) are to be considered normative.
- 5.1.3 Proposals shall be *precise* and *functionally complete*. All relevant assumptions and context required for implementing the specification shall be provided.
- 5.1.4 Proposals shall specify *compliance points* that clearly state what features all implementations must support and which features (if any) may *optionally* be supported.
- 5.1.5 Proposals shall *reuse* existing OMG and other standard specifications in preference to defining new models to specify similar functionality.
- 5.1.6 Proposals shall justify and fully specify any *changes or extensions* required to existing OMG specifications. In general, OMG favors proposals that are *upwards compatible* with existing standards and that minimize changes and extensions to existing specifications.
- 5.1.7 Proposals shall factor out functionality that could be used in different contexts and specify their models, interfaces, etc. separately. Such *minimalism* fosters re-use and avoids functional duplication.
- 5.1.8 Proposals shall use or depend on other specifications only where it is actually necessary. While re-use of existing specifications to avoid duplication will be encouraged, proposals should avoid gratuitous use.
- 5.1.9 Proposals shall be *compatible* with and *usable* with existing specifications from OMG and other standards bodies, as appropriate. Separate specifications offering distinct functionality should be usable together where it makes sense to do so.

- 5.1.10 Proposals shall preserve maximum *implementation flexibility*. Implementation descriptions should not be included and proposals shall not constrain implementations any more than is necessary to promote interoperability.
- 5.1.11 Proposals shall allow *independent implementations* that are *substitutable* and *interoperable*. An implementation should be replaceable by an alternative implementation without requiring changes to any client.
- 5.1.12 Proposals shall be compatible with the architecture for system distribution defined in ISO's Reference Model of Open Distributed Processing [RM-ODP]. Where such compatibility is not achieved, or is not appropriate, the response to the RFP must include reasons why compatibility is not appropriate and an outline of any plans to achieve such compatibility in the future.
- 5.1.13 In order to demonstrate that the specification proposed in response to this RFP can be made secure in environments requiring security, answers to the following questions shall be provided:
- What, if any, are the security sensitive elements that are introduced by the proposal?
 - Which accesses to security-sensitive elements must be subject to security policy control?
 - Does the proposed service or facility need to be security aware?
 - What default policies (e.g., for authentication, audit, authorization, message protection etc.) should be applied to the security sensitive elements introduced by the proposal? Of what security considerations must the implementers of your proposal be aware?
- 5.1.14 The OMG has adopted several specifications, which cover different aspects of security and provide useful resources in formulating responses. [CSIV2] [SEC] [RAD].
- 5.1.15 Proposals shall specify the degree of internationalization support that they provide. The degrees of support are as follows:
- a) Uncategorized: Internationalization has not been considered.
 - b) Specific to <region name>: The proposal supports the customs of the specified region only, and is not guaranteed to support the customs of any other region. Any fault or error caused by requesting the services outside of a context in which the customs of the specified region are being consistently followed is the responsibility of the requester.

- c) Specific to <multiple region names>: The proposal supports the customs of the specified regions only, and is not guaranteed to support the customs of any other regions. Any fault or error caused by requesting the services outside of a context in which the customs of at least one of the specified regions are being consistently followed is the responsibility of the requester.
- d) Explicitly not specific to <region(s) name>: The proposal does not support the customs of the specified region(s). Any fault or error caused by requesting the services in a context in which the customs of the specified region(s) are being followed is the responsibility of the requester.

5.2 Evaluation criteria

Although the OMG adopts model-based specifications and not implementations of those specifications, the technical viability of implementations will be taken into account during the evaluation process. The following criteria will be used:

5.2.1 Performance

Potential implementation trade-offs for performance will be considered.

5.2.2 Portability

The ease of implementation on a variety of systems and software platforms will be considered.

5.2.3 Securability

The answer to questions in section 5.1.14 shall be taken into consideration to ascertain that an implementation of the proposal is securable in an environment requiring security.

5.2.4 Compliance: Inspectability and Testability

The adequacy of proposed specifications for the purposes of compliance inspection and testing will be considered. Specifications should provide sufficient constraints on interfaces and implementation characteristics to ensure that compliance can be unambiguously assessed through both manual inspection and automated testing.

5.2.5 Standardized Metadata

Where proposals incorporate metadata specifications, usage of OMG standard XMI metadata [XMI] representations must be provided as this allows

specifications to be easily interchanged between XMI compliant tools and applications. Since use of XML (including XMI and XML/Value [XML/Value]) is evolving rapidly, the use of industry specific XML vocabularies (which may not be XMI compliant) is acceptable where justified.

6.0 Specific Requirements on Proposals

6.1 Problem Statement

6.1.1 What is a business rule?

Business rules are simple atomic statements that define or constrain some aspect of business operations.

“A Business Rule is a directive, intended to influence or guide business behavior, in support of Business Policy that has been formulated in response to an Opportunity, Threat, Strength, or Weakness.

It is a single Element of Guidance that does not require additional interpretation to undertake Strategies or Tactics.

A Business Rule is:

- highly structured.
- discrete or atomic.
- carefully expressed in terms of standard vocabulary.”[1]

The term ‘business’ [mass noun] is used here in its core sense, “a person's regular occupation, profession, or trade,”[2] and refers to any kind of organized, purposeful human work activity. ‘A business’ [count noun] means an enterprise or a company or other kind of organization. The business rules concept applies to the policies and rules by which any organization – commercial, governmental, educational – carries out its activities and fulfills its purpose.

Much of the industry's understanding of 'business rules' has been historically shaped by the GUIDE definition, which established a general frame of reference around which much continuing work has been centered:

“A Business Rule is a statement that defines or constrains some aspect of the business. This must be either a term or fact, a constraint, or a derivation. It is ‘atomic’ in that it cannot be broken down or decomposed further into more detailed business rules. If reduced any further, there would be loss of important information about the business.”**Error! Reference source not found.**

The semantic essence of a business rule – regardless of its syntax – expresses a crisp logical definition of some facet of the organization's way of doing business. A typical organization will have between 10⁴ and 10⁶ rules of this kind, depending on the precise nature of the business.

For purposes of this RFP, a ‘business rule’ is a guide covering conduct, action, practice or procedure within a particular business activity or business sphere.

6.1.2 The vocabulary of business rules — a ‘Business Vocabulary’

An important feature of business rules is that they can be presented to business people in their own terminology. That is, business rules must be readable by "business people" — the people who have responsibility for the business activities to which the rules apply, and the people who understand how the rules relate to the business objectives. The syntax of rules can be textual or graphical, but the vocabulary is a business vocabulary, meaningful to the people who make and abide by the business rules. And the meaning is a "business" meaning.

A vocabulary is "a sum or stock of words (Symbols) employed by a language, group, individual, or work, or in a field of knowledge." [4]

A ‘Business Vocabulary’ is a vocabulary whose definitions consist of the shared understanding among a community of business people of the things they have to deal with to run the business, and whose words and phrases have been agreed by the community to refer uniquely to one of the definitions within a subject context. A true ‘Business Vocabulary’ is in on-going general use within its business community as part of the corporate culture.

Note: While information systems experts are "business people", the business activities for which they have responsibility are restricted to the development and maintenance of information systems that support other business activities. They are not "business people" with respect to those other activities, and their vocabulary is not, in most cases, the vocabulary of business people in that community. A vocabulary that is created by information systems experts for the purpose of specifying the business requirements for, and the design of, an automated information system that supports business activities is *not* owned by, or part of the on-going corporate culture of, the business people responsible for those activities. Even when it employs terms commonly in use in the business, their meaning is often restricted to, or colored by, the information systems concepts that are used to represent the corresponding business concepts. Such a vocabulary is *not* a ‘business vocabulary’ and would better be termed an “information technology model of business concepts”.

6.1.3 Information technology for Business Rules

Business rules form an important part of the definition of an organization's information resources and needs, in particular as related to guidance, control and knowledge. Business rules are one of several elements that work in concert to provide a comprehensive definition of the static and dynamic information aspects of an organization. Other elements include the things of concern to the organization, the operational processes of the organization, the events to which the organization expects to react, and so on. A complete collection of rules, processes, events, and so on, is sometimes referred to as a "business model".

As more aspects of a business have become automated over the last 40 years, many of the policies and rules by which business people run their business have become part of automated systems. That practice, however, has led to representations of the business rules that are understood only by the automated systems and by the technical experts who develop the software. Because of this, the ability of the business experts to examine, review and correct those rules is limited. And as a consequence, the ability of the business to change those rules as needed to respond to the marketplace, and the ability of the organization to respond to changes in its environment in a timely manner, are greatly impaired.

The cornerstone needed to address this problem is a means for business people to define their business rules in their own language, in terms of the things they have to deal with to run the business, but in ways that are clear, unambiguous, comprehensive, and consistent. When they can't define business rules well, it is very difficult for business people to think clearly and communicate well about business policy and the logic of the business, to find and use the rules that apply to a given situation, and to share and preserve their business know-how. Conversely, preservation of business rules clearly stated in business terms provides considerable advantages. For example, it allows business requirements and intentions to be reviewed and adapted before effort is wasted on poorly thought out plans; it provides the organization with a free choice of implementation strategies; it greatly facilitates subsequent business re-engineering; it distinguishes business responsibilities and operational responsibilities; it supports the assignment of responsibilities; and so on.

To use and preserve a model of the business that includes business rules, it is necessary to provide means for capturing, preserving, retrieving and modifying those rules. A number of software tools now exist to provide these capabilities. And it is also necessary to make these rules translatable by information technology experts, and the supporting software tools, into rules that can be executed by automated systems. One implication of this is that business rules should have a representation that is independent of any proprietary tool or language, in order to facilitate transfer of business models between different tools. At the same time, the growth of electronic trading and other automated business agents is creating a demand for some means of providing visibility of an organization's trading rules to its customers, suppliers and other business partners. This implies an additional need for the transfer of business rules between organizations.

6.1.4 Objectives of this RFP

All of these goals can be achieved by a common specification for expressing business rules in a form that allows their semantics to be defined and preserved when transferred to another location. It is not essential for the original syntax to be preserved: for example, a rule originally expressed in, say, English may be

equally valid if expressed in, say, Japanese (though it might be convenient to preserve both expressions as an aid to business communication).

The objective of this RFP is to provide that common specification. This RFP requests a specification for a standard "metamodel" for capturing the knowledge contained in business rules.

In general, the vocabularies for business rules (the business terms used in the rules), and the natural structures for their representation as used by business people, will be derived from natural languages. So there will over time be many notations for business rules, at least as many as are needed to accommodate the differences in natural language structures. But if each of these notations can be unambiguously translated into a representation in the standard metamodel, the first critical step in "rules translation" will have been achieved – a common "structural sense" for the rules. The second critical step – translation of business vocabularies from language to language (or from community to community) – can be undertaken by business experts who are fluent in the two languages. Together, these two steps enable the translation of business rules across notations and natural language communities.

The further objective of the standard metamodel is to make the business rules accessible to software tools of several kinds, including:

- software tools that support the business experts in creating, finding, validating, and managing business rules, and
- software tools that support the information technology experts in converting business rules into implementation rules for automated systems.

For this latter purpose, the use of a standard meta-modeling language with a standard exchange representation is important. This RFP requires the metamodel to be formulated in the form specified by the OMG Meta-Object Facility standard, for which a standard exchange representation (XMI) also exists.

6.1.5 Relationship to the Model-Driven Architecture

These concepts fit very comfortably into the OMG view of Model Driven Architecture (MDA). The various elements of a business model, including business rules, encompass the Business Model level (formerly the Computation Independent Model, CIM level) of MDA. Business rules can be realized in many different ways: in object-oriented programs, as consistency/validity checks in a relational database, as structural requirements for an XML document, in rules engines, and so on. All of these realizations correspond to different classes of platform at the Platform Independent Model (PIM) level of MDA. And these in turn have mappings to specific technologies at the Platform Specific Model (PSM) level.

The use of formal business rules in business modeling is not so mature a discipline that suitable languages are commonly implemented, or even that the expressive power of the several languages now in use is equivalent. For this reason, this RFP makes optional the specification of a formal notation in which to write business rules. That is, this RFP will not result in a language in which to write the business rules for Business Models. But the metamodel sought by this RFP should provide the 'abstract syntax' for such a language, and document the concepts that should be available for formulating rules in Business Models.

6.2 Scope of Proposals Sought

The scope of proposals in response to this RFP should be limited to defining models and languages for capture and exchange of business rule semantics. Other related topics (such as rule management) will be the subject of separate RFP documents to be released at a future date.

6.2.1 'Business Rules' specified by and for business people

To qualify as a Business Rule for which business people have the primary concern, and therefore a rule that is in the scope of this RFP, a rule must meet all of the following criteria:

- The content of the rule must be about business policy, guidance, practice, or the meaning behind business terminology.
- The rule, or the meaning of the rule, is or should be the responsibility of the people who run the business.
- The rule is defined in terms of business concepts, i.e. in terms of the actual things¹ that the business people have to deal with as they run the business, and is expressed in language close to the language the business people actually use to communicate with each other.

¹ 'Thing': "That which has actual, distinct and demonstrable existence outside of the mind, not restricted to direct knowledge through the senses, but including that for which its existence is inferred from its signs or effects"[5].

(Latin core term, '*res*') Whatsoever – literally anything that exists external to the mind of the thinker (including that which exists as an idea formulated in the mind of another thinker); literally anything which can be talked about. A 'thing' can be either tangible (animal, vegetable or mineral) or intangible; specific (a particular) or generic (a concept, a universal); unitary or composite; lexical or non-lexical; an event or an enduring thing; and whether or not its existence is perceived as continuing independently from the existence of other things.

There is no adequate word in English for this core concept. In English, 'thing', taken in its very broadest sense, is the closest word. The all-inclusive nature of this is most closely indicated by: 'anything', everything, something, and all things.

- The rule is independent of, and makes no reference to, the technology or system mechanics, whether manual or automated, by which the recordkeeping and enforcement for the rule is implemented, except where those notions have become "business concepts", i.e., accepted as part of the terminology and standards of practice in that business community.

A Business Rule may be specific to a particular state that the business is in.

A Business Rule need not be "actionable", because it is fuzzy, politically sensitive, or because of technical limitations or economic factors.

A Business Rule need not be implemented and/or enforced by an automated system.

A rule that defines required behaviors of information system elements or required relationships among them is out of the scope of this RFP. Such rules can be captured by existing standard metamodels, such as those of UML, OCL and EDOC (see 6.3).

6.2.2 'Declarative' rules

This RFP requests a specification for a standard MOF "metamodel" for capturing the meaning of declarative business rules.

A declarative business rule is a business rule that:

- makes no reference to when or where it will be evaluated or enforced, other than its applicability;
- makes no reference to how it will be implemented or enforced;
- makes no reference to who or what will evaluate or enforce it.

In a collection of declarative rules, the order of the rule statements has no meaning. The order of evaluation of rules is implicit in the semantics of the rules themselves.

A common specification for exchange of 'production rules' – a kind of rule closely coupled to a class of information systems – is the subject of a separate RFP, and is considered to be out-of-scope for this RFP.

6.2.3 The Business Rules Metamodel

This RFP requests the proposals to define a Business Rules Metamodel (BRM) — a metamodel for the specification of Business Rules, as defined in 6.2.1 and 0. A metamodel is a formal description of the structures in a knowledge base that would capture the knowledge contained in the business rules in an unambiguous

way, i.e. in a way that is underpinned by formal logic. The model must also include the rules for interpretation of those structures, that is, the rules for interpreting the formalisms, although this may be by reference to some standard logical notation.

In the terms of the Meta-Object Facility, the metamodel describes the structures in terms of objects, properties and relationships among them. A set of business rules captured in such a set of structures is a "model" of a particular business (or part of it) and is an "instance of the metamodel".

In MOF terms, the Business Rules Metamodel consists of two major components:

- 'Abstract syntax', which presents the linguistic elements of a business rule, together with their properties and relationships, as a UML class diagram, using MOF 2.0.
- 'Static semantics': well-formedness rules for constructing a meaningful population of the abstract syntax model, stated as constraints on the meta-classes, the meta-associations (relationships), and the meta-attribute values (properties). These constraints are usually stated in OCL.

The Business Rules Metamodel should support all kinds of business rules that meet the definitions above, including:

- "High-level" rules or "general rules" or "policies" that govern the business as a whole but are not implemented directly in business activities.
- Rules that act as a constraint upon transitions between business processes
- Structural rules that constrain relationships between business things
- Rules that make reference to business events
- Rules that derive business facts
- "Universal" rules that apply to all relevant aspects of the business
- "Contextual" rules that apply to specific business situations

6.2.4 Business vocabularies

The Metamodel should support the definition of the Business Vocabulary from which the terms used in the rules can be taken and can be unambiguously interpreted by business persons. That is, each term should have either a unique definition, or multiple definitions from which a unique one can be determined from context, where that context is somehow determinable from the captured rule.

Business rules refer to various business terms: expressing relationships between terms, defining bounds for the possible values of terms, and so on. Business rules cannot be specified without relationship to a business vocabulary.

Business rules may also be used to define terms. That is, a category of business thing may be defined by the rules its members obey. And in some cases a unique instance may be identified by some rule that it alone obeys.

6.2.5 "Business-friendly" notations that express business rules

Business rules may be expressed using multiple notations, which might be textual or graphical. It is not the intent of this RFP to mandate any particular notation, although it is important to understand how such notations may be created. The core feature that is relevant to this RFP is the Model – the underlying semantic expression of the rule.

Many of the tools that would be expected to use the proposed BRM will provide a "business-friendly" notation for interface to human users, and in particular to business users. Such a notation allows the business user to specify things the way s/he thinks about them naturally, using the business vocabulary and other natural language constructs, although perhaps in structured ways, in stating the rules.

Proposals should provide the ability to capture all kinds of Business Rules, specified in any of the following ways, or in any combination of them:

- in business-friendly natural language sentences.
- in a business-friendly graphic notations.
- in decision tables and decision trees.
- in the "business forms" metaphor – a notation in the style of common business documents and forms, which is typical of conventional user interfaces to business processes and to business applications whose interfaces are based on them (such as QuickBooks and Quicken).

The business user is not expected to use the Business Rules Metamodel directly.

The business user is not expected to state rules using highly formalized constructs that are typical of logicians and mathematicians, or using artificial modeling constructs that are typical of software modeling and development tools intended for use only by information systems staff. But the software tools that support the BRM may also produce representations (of at least some of the business rules) in such forms for such audiences.

6.2.6 Mappings to the Business Rules Metamodel

This RFP requests a mapping from at least one business-friendly notation in common use (graphical or textual syntax) into the constructs of the BRM. The selected notation should be natural for business people in some language/business community. The mapping from the notation(s) into the proposed metamodel is intended primarily as "proof-of-concept" for the BRM.

It is not the intention of this RFP to result in a standard for a business-friendly language. As observed above, over time there may be many such notations for different business and language communities.

6.2.7 Context of rules

A rule statement can often be greatly simplified by implying the context of rule, rather than having to explicitly state all contextual conditions in the rule statement. Context can have many forms – community, subject, locality of reference, surrounding references, perspective, implied qualifiers, etc. For example, the rule "If the customer's shopping cart total is over > \$100, then the customer is entitled to..." has an implied context of a particular customer placing an order and listing the items being ordered in a "shopping cart". In capturing such rules simply and unambiguously, it is necessary that the context be well defined, and this context information may need to be incorporated into the formal semantic description of the rule.

6.2.8 Rule templates

In capturing business rules, a group of closely related rules may be captured as a structured collection, in such a way that the structure itself conveys an important semantic relationship among the atomic rules. Decision tables and decision trees are examples of rule templates.

6.2.9 Rulesets

A collection of business rules grouped together for some purpose is sometimes called a *ruleset*. Rulesets are implicitly associated with some community of business people for whom they apply. Rulesets may also be formalized as a group that applies to specific aspects of the business, specific business operations, specific authorities, etc. In general, a ruleset can correspond to any notion of "collection" the business community wants to use.

A given rule can belong to more than one ruleset.

A ruleset should never contain contradictory rules. But it may contain both "high-level" rules or "policies" that are not directly implemented in business

operations and "derived" rules that interpret the same high-level rule differently for different business situations.

Because any collection of business rules can be considered a ruleset, a "model" in the MOF sense – a collection of instances corresponding to the Business Rules Metamodel – is a ruleset. Some such rulesets will consist only of definitions of terms and may therefore be called a "vocabulary". Whether the BRM itself distinguishes rulesets is a matter for the proposal.

Rulesets usually have a set of associated "meta-data" that describes the collection itself – its purpose, its authority, its version, its relationship to other rulesets, etc. In general, these are "rules management" concerns, and are out of the scope of this RFP. (They are intended to be part of the scope of a future "rules management RFP".) Such concepts should only appear in proposals to the extent that they may be required for proper interpretation of the ruleset, i.e. to the extent that they state an implied context (condition) for the rules contained in the ruleset.

6.2.10 Enforcement

Enforcement has the usual meaning – the means of ensuring that a rule is obeyed, i.e. enforcement is the mechanism by which the rule is enforced. Enforcement is defined in business processes, and is out-of-scope for this RFP.

Enforcement level is a business policy regarding how strictly the rule will be enforced. Enforcement level is expressed as a position in a graded scale of values that specifies the severity of action imposed in order to enact a business rule or keep it in force.

Associating a rule with an enforcement level (see **Error! Reference source not found.**) is considered to be in-scope for this RFP, to the extent that the "enforcement level" expresses some intrinsic semantics of the rule itself. For example, "enforcement level" can be a distinction between guidelines and rules that are tightly enforced, or between legal requirements, corporate policies, and operating rules. In general, "enforcement level" can be considered a special case of "categories of rules".

6.2.11 Business Rules in other business models

Business rules are used to make business decisions and provide control for business processes in a number of ways. As a consequence, there is a close relationship between business processes and business rules, and there are links between information systems that support rules and information systems that

support business processes. Addressing this linkage, including rules as origins of events and rules as constraints on process transitions, is a requirement of the Business Process Definition Metamodel RFP (see 6.4.4).

In general, business rules can appear in several kinds of business models. As formal semantic models for business process elements and other business model elements appear, there will be a need to integrate the Business Rules Metamodel with them. But the relationship of business rules to other business models is out of scope for this RFP.

6.2.12 Relationship to formal logic

The underlying structure of declarative business rules is equivalent to that of formal logics, especially First Order Predicate Logic, supplemented by various mathematical constructs (e.g. sets and arithmetic).

The principal elements of first order predicate logic, as interpreted for business rules are:

- **Term:** a signifier for an individual thing. Terms may be Constants, representing specific things, or Variables, representing arbitrary things. In business rules, Terms represent things that business people have to deal with to run the business. Terms may also represent sets of such things and classifications of such things.
- **Predicate:** a statement about some set of variable Terms, which for any given set of Constants substituted for the variables will be either true or false. In business rules, predicates represent potential conditions of the things of the business, where those conditions are recognizable by business people and are defined in the Business Vocabulary.
- **Quantifier:** a control on the scope of reference of a variable Term, primarily "all" (for all x , $P(x)$) and "at least one" (there exists x such that $P(x)$)
- **Logical operators:** IMPLIES, AND, OR, NOT, and possibly others.
- **Proposition:** an expression involving logical operators, the predicates, and constant or quantified Terms, that may be true or false for a given set of constant terms.
- **Axioms and postulates:** propositions that are assumed to be true (for all substitutions for any variable Terms they contain). In business rules, these are separated into:
 - **Facts:** propositions in which all of the terms are constants or definite descriptions (see below), interpreted as statements about specific things of the business that are known or assumed to be true.

- Rules: propositions in which some of the Terms are quantified Variables, interpreted as statements about arbitrary things of the business that are required to be true.

Note – The Predicate Logic meaning of "Term" includes "terms" of the Business Vocabulary, when they refer to individuals, sets or classes, but it also extends to any other individual, set or class to which a Predicate may be applied.

Note – A "definite description" is a thing defined by the truth of a predicate: the x such that $P(x)$. E.g. "the president of company ABC" is not a true Constant, but it is a specific Person, defined by: the Person p such that $\text{is-president-of}(p, \text{ABC})$ is true. A definite description may also characterize a set, e.g. all customers who bought a vehicle in May. In the predicate calculus, the "definite description" is a predicate that appears directly in the proposition, properly qualified and linked to other predicates by appropriate logical operators. But in mathematics and in business rule formulation, it is common to express the definite description as a separate definition (in context) of a term that appears in the proposition as a constant.

6.3 Relationship to Existing OMG Specifications

6.3.1 Modeling and metadata specifications

The following OMG specifications are referred to in this RFP. Many of these specifications are currently undergoing a major revision (see 6.4.x). Submitters should consult the OMG catalog at:

http://www.omg.org/technology/documents/modeling_spec_catalog.htm
to find the current versions of these specifications.

Meta-Object Facility (MOF) – specifies the form and other requirements for a metamodel.

XML for Metadata Interchange (XMI) – specifies the exchange form for metamodels and the rules for construction of metamodel-specific exchange forms for "models". In this RFP, a "model" is a ruleset expressed as instances of the Business Rules Metamodel.

Object Constraint Language (OCL) – may be used in specifying the BRM to express detailed rules for relationships among BRM metamodel elements.

Unified Modeling Language (UML), – used in the proposal to depict the BRM.

6.3.2 Existing standard metamodels

UML Profile for Enterprise Distributed Object Computing (EDOC) – specifies macro level modeling of IT components and modeling of IT system constraints. Unification with some elements of this metamodel would be useful in specifying information technology elements that appear in business models, and in linking the IT implementation of a business rule to the rule itself.

Common Warehouse Meta-Model (CWM): "Business Nomenclature" metamodel – specifies a partial model of business vocabularies, although its purpose is to associate a business vocabulary with a data model.

6.4 Related Activities, Documents and Standards

6.4.1 Referenced ISO standards

Clause 6.5 requires alignment of certain elements of the proposal with these ISO standards:

- ISO 704:2000 Terminology work – Principles and methods
- [ISO 1087-1:2000](#) Terminology work – Vocabulary – Part 1: Theory and application

6.4.2 Related ISO standards

- ISO Terminology standards:
 - ISO 860:1996 Terminology work – Harmonization of concepts and terms
 - ISO 10241:1992 International terminology standards – Preparation and layout
 - ISO 12620:1999 Computer applications in terminology – Data categories
 - ISO 15188:2001 Project management guidelines for terminology standardization
- ISO Thesauri:
 - ISO 2788:1986 Documentation – Guidelines for the establishment and development of monolingual thesauri
 - ISO 5964:1985 Documentation – Guidelines for the establishment and development of multilingual thesauri
- ISO/IEC 13250:2000 Information technology – SGML Applications – Topic Maps.
Note: this standard is currently in revision and a draft of the revision is available at:
http://www.y12.doe.gov/sgml/sc34/document/0322_files/iso13250-2nd-ed-v2.pdf

- ISO/IEC 10746 "Reference Model of Open Distributed Processing" (RM-ODP) Parts 2 and 3, available via:
http://isotc.iso.ch/livelink/livelink/fetch/2000/2489/Ittf_Home/PubliclyAvailableStandards.htm
particularly in the Enterprise Viewpoint and the Information Viewpoint..
- ISO/IEC 15414:2001 (=ITU-T Recommendation x.911) Reference Model of Open Distributed Processing (RM-ODP) Enterprise Language
- ISO TR 8002:1984 Concepts and Terminology for the Conceptual Schema and the Information Base
- ISO/IEC 11179 Metadata registries:
ISO/IEC FCD 11179-1:2003 Information technology – Metadata registries (MDR) – Part 1: Framework, (current draft) available from <http://www.jtc1sc32.org>, as document number 0992.
ISO/IEC 11179-3:2003 Information technology – Metadata registries (MDR) – Part 3: Registry metamodel and basic attributes, available via:
http://isotc.iso.ch/livelink/livelink/fetch/2000/2489/Ittf_Home/PubliclyAvailableStandards.htm
ISO/IEC FCD 11179-4:2002 Information technology – Metadata registries (MDR) – Part 4: Formulation of data definitions, (current draft) available from <http://www.jtc1sc32.org>, as document number 0909.

6.4.3 Revision of OMG modeling and metadata specifications

OMG is currently performing a coordinated major revision of its modeling specifications. This will lead to a new family of UML and MOF specifications. Most of these revisions are in advanced states of the process with largely stable specifications. Proposals should prefer to align with (or conform to, where required) the new versions of these specifications:

- UML 2.0 Infrastructure: http://www.omg.org/techprocess/meetings/schedule/UML_2.0_Infrastructure_RFP.html
- UML 2.0 Superstructure: http://www.omg.org/techprocess/meetings/schedule/UML_2.0_Superstructure_RFP.html
- UML 2.0 OCL: http://www.omg.org/techprocess/meetings/schedule/UML_2.0_OCL_RFP.html
Note: OCL v2.0 contains a MOF metamodel of "rules"
- MOF 2.0 Core: http://www.omg.org/techprocess/meetings/schedule/MOF_2.0_Core_RFP.html
- MOF 2.0 XMI: http://www.omg.org/techprocess/meetings/schedule/MOF_2.0_XMI_RFP.html

- MOF 2.0 Query/View/Transform:
http://www.omg.org/techprocess/meetings/schedule/MOF_2.0_Query_View_Transf._RFP.html

6.4.4 Related OMG Work-in-Progress

These activities will produce specifications that are closely related to the purpose and content of this RFP and the corresponding proposals:

- Model Driven Architecture (MDA): <http://www.omg.org/mda/specs.htm> – specifies an architecture for modeling that includes business rules in the Business Model tier, primarily as a means of expressing the business requirements for information systems
- Business Process Definition Metamodel RFP:
http://www.omg.org/techprocess/meetings/schedule/Business_Proc_Def_Metamod_RFP.html – requests a metamodel for specifications of business processes. Proposals are expected to have "hooks" for references to business rules, and thus for subsequent integration of the metamodels.
- Ontology Definition Metamodel RFP:
http://www.omg.org/techprocess/meetings/schedule/Ontology_Definition_Metamod.RFP.html – requests a metamodel for specifications of "ontologies" (definitions and rules) consistent with the capabilities of the Ontology Web Language (OWL). Alignment, or formal mapping, between the Business Rules Metamodel and the Ontology Definition Metamodel will be a longer term OMG requirement, but early alignment where possible will be an advantage to all submitters.

6.4.5 Other publications

Business Rules Applied, Barbara von Halle, John Wiley and Sons, 2001

Business Rules and Information Systems, Tony Morgan, Addison-Wesley, 2002

Business Rules Journal, BRCommunity.com, available at:
<http://www.brcommunity.com>

The Business Rules Manifesto, the Business Rules Group, 2003, available at:
<http://www.businessrulesgroup.org/brmanifesto.htm>

Principles of the Business Rules Approach, Ronald G Ross, Addison-Wesley, 2003, ISBN 0201788934

Structuring Business Vocabulary for Business Rules, the Business Rules Group, current draft available at: <http://www.businessrulesgroup.org/RFIresponse.htm>.

6.5 Mandatory Requirements

Proposals shall define the Business Rules Metamodel (BRM) – a metamodel for capturing the semantics of business rules.

The proposed metamodel shall conform to the specifications in 6.5.1.

The proposed metamodel shall support the specification of Business Rules, as defined in 6.2, and as further elaborated in 6.5.2.

The proposed metamodel shall support the definition of a Business Vocabulary, as defined in 6.2.4, and as further elaborated in 6.2.4.

The proposed metamodel shall support the inclusion of Business Facts, as specified in 6.2.3.

The proposed metamodel shall support the mappings required by 6.5.5, 6.5.6, and 6.5.7.

6.5.1 Specification of the Business Rules Metamodel

6.5.1.1 Form of the BRM

The BRM shall be specified as a MOF-compliant metamodel. That is, the metamodel shall be specified using the constructs of, and conforming to other requirements of, the Meta-Object Facility, v2.0.

The metamodel shall be depicted using the language of MOF 2.0. Additional structures for the capture of constraints on the metamodel elements and relationships may be needed, and additional modeling languages may be used to express them.

NOTE – the MOF model alone will not capture either the meanings of the terms used in that model nor most of the intended predicates.

6.5.1.2 Definitions of BRM elements

The proposed metamodel shall be accompanied by a glossary containing a full definition of every term used to label any of the ‘metamodel’ constructs.

The glossary shall also include (possibly by reference to a published vocabulary) a full definition of any word or phrase (‘term’) used in these definitions, where that word or phrase does not refer to its common natural language meaning.

These definitions shall follow the terminology and vocabulary guidelines of ISO 704.

The proposed metamodel elements, and their definitions, shall be independent of the constraints or viewpoints of particular programming languages, database systems, middleware technologies, software development tools, and other technological artifacts.

6.5.1.3 Formal specification of metamodel rules

The proposed BRM shall include a complete formal statement of all facts and rules that appear in the metamodel itself. Those statements shall be made in one of:

- OCL (v2.0 if stable),
- a business modeling notation that is mapped to the metamodel per 6.5.5, or
- in accompanying text.

6.5.1.4 Compatibility with existing metamodels

The BRM specification shall re-use structural elements of the OCL (v2) metamodel wherever the definition of the OCL element essentially coincides with the definition of some construct in the BRM (and only in such cases).

The BRM specification shall re-use structural elements of the UML (v2) Infrastructure metamodel wherever the definition of the UML element essentially coincides with the definition of some construct in the BRM (and only in such cases).

The BRM specification shall re-use structural elements of the MOF (v2) metamodel wherever the definition of the MOF element essentially coincides with the definition of some construct in the BRM (and only in such cases).

6.5.1.5 Examples of metamodel constructs

The proposal shall include examples illustrating each ‘metamodel’ construct.

6.5.2 Capture of Business Rules

6.5.2.1 Generality

The proposed metamodel shall provide the ability to capture all kinds of Business Rules, as defined in Section 6.2.1.

The proposed metamodel shall support non-actionable rules (see 6.2.1).

The proposed metamodel shall support rules that may not be implemented and/or enforced by an automated system.

The proposed metamodel shall support business rules that are specific to a particular state that the business is in, that is, based on the states of 'business things' (see also 6.5.3.7).

The proposed metamodel shall be scalable to large populations of rules (i.e. up to 10^6 rules)

6.5.2.2 Declarative form

The BRM shall capture business rules in a way that supports the following constraints on rule formation:

- The rule shall be specified declaratively (see 6.2.2). Interpretation of a rule shall not depend on sequence of execution or sequence of condition testing, or on data processing actions. Support for decision trees, however, is required (see 0)
- The rule shall be stated in terms of the things, and the connections among them, that business people have to deal with to run the business;
- The rule shall be specified in terms of the definitions of 'things' and not in terms of their signifiers. This ensures that rules are specified independently of different wording in the same language; different natural languages such as English, French, Mandarin; different types of alphabets (character or pictorial); specialized sets of symbols and their syntax such as mathematical symbols and expressions.
- The rule shall be captured once (the meaning of the business rule) regardless of how many different ways that business rule may be expressed.
- The rule shall be stated in terms of the Business Vocabulary – the shared understanding among business people of the things that they have to deal with to run the business, and the language they use to talk about them with each other.

6.5.2.3 Consistency with formal logic

The BRM shall capture Business rules in a way that is consistent with formal logics, as described in 6.2.12.

6.5.2.4 Atomicity

Business rules shall be captured:

- in atomic form, such that they cannot be subdivided when expressed in terms of the things of the business.
- in such a way that all rules are treated as a single coherent body of logic.

6.5.2.5 Independence from other models

The specification of business rules and the forms of expression of business rules must be first-class constructs whose existence does not depend upon anything other than the business vocabulary.

6.5.2.6 Independence of implementation

Business rules shall be specified without any reference to the system by which the business rule will be implemented and/or enforced including, among other things:

- business events except as part of the criteria of the rule condition
- system events (when it will be implemented / enforced)
- actions by which the rule will implemented or enforced
- who implements / enforces
- how implemented / enforced
- where implemented / enforced.

6.5.2.7 Independence of Enforcement

Business rules shall be specified independent of their enforcement level.

6.5.2.8 Enforcement

Proposals shall provide business people with the ability to specify, for all kinds of Business Rules (as 'Business Rules' is defined in Section 6.2), the enforcement level required for each Business Rule.

Note: Enforcement is defined in business processes and is out-of-scope for this RFP.

6.5.2.9 Categorization of rules

Proposals shall provide a set of semantic categories of business rules, i.e. classification by semantic aspects that relate to their intended interpretation. For

example, ‘derivation rules’ for rules that derive business facts from other facts, or ‘rejector rules’ for rules that prevent certain changes in the state of the business.

Note: This is different from rule management categorization schemes that are imposed on rules for various organizational purposes, which is out-of-scope for this RFP. This requirement is to capture interpretation semantics that may not be apparent in the logical model (predicates) of the rule itself.

6.5.2.10 Rule templates

Proposals shall provide a means of capturing the semantics of rule templates, including at least decision tables and decision trees.

6.5.2.11 Predicates

The proposal shall provide a means to

- specify unary predicates, i.e. predicates which involve only one role, for example, ‘Person smokes’
- specify n-ary predicates, i.e. predicates which involve n distinguished roles (formal parameters), where n is a fixed value for any given predicate, can be 1 or more, and is not (in principle) bounded.
- specify the definition of a predicate as the evaluation of a condition (see 6.2.12)
- specify the definition of a predicate as a derivation from, or composition of, other predicates (6.5.2.13)
- specify the definition of a predicate by any mechanism provided for definition as an entry in the Business Vocabulary.
- formally define a context for a set of rules (see 6.2.7) as a predicate

6.5.2.12 Conditions

The proposed mechanisms supporting the specification of rules shall provide a means to:

- specify conditions that reference generic ‘things’ including other conditions and specific (particular) ‘things’ found in the Business Vocabulary including things adopted into the vocabulary such as dates and times.
- specify conditions that involve comparisons and mathematical operators

- specify conditions that involve evaluation of predicates for specific instances (facts, assertions), where the predicates are as specified in 6.5.2.11.
- specify conditions involving evaluations of n-ary predicates in which the same ‘thing’ (instance) can play multiple roles.
- specify compound conditions involving other conditions, with conjunctions (AND) and disjunctions (OR) and negations (NOT)
- specify the order of interpretation of the component conditions in a compound condition, where that order affects the logic of the condition.

6.5.2.13 Derivations and Calculations

The proposed mechanisms supporting the specification of rules shall provide a means to:

- specify simple numeric calculations formally
- specify calculations involving, and resulting in, sets and lists of things
- specify default values as rules, the equivalent of derivations that are assumptions rather than fact.
- specify the full logic of derived predicates (facts, assertions, connections among ‘things’) as conditions (or compound conditions).
- in defining a predicate by a derivation/calculation, refer to distinct instances of a type of ‘thing’ where the multiple instances of the same generic type play distinct roles in the predicate.
- specify a derived predicate in terms of a projection over a role path involving one or more predicates, together with any other relevant restrictions and operator/function applications.

6.5.2.14 Relationship to Business Vocabulary

Proposals shall define how business rule references to business terms are to be made.

Proposals shall provide the ability to treat business rules as business vocabulary entries, thereby giving business rules all of the metadata associated with a business vocabulary entry, including unique names of rules.

Proposals shall specify the nature of the coupling between a rule and the terms on which it depends.

Proposals shall specify the nature of the coupling between a rule and the terms which it controls.

6.5.3 Capture of Business Vocabulary

The proposed metamodel shall support the specification of a Business Vocabulary (as defined in Section 6.2) on which Business Rules specifications are based.

6.5.3.1 *Scope of Business Vocabulary*

The proposal shall provide a means to

- enter in the business vocabulary any term used in a business rule that needs to be defined.
- enter business rules in the business vocabulary as ‘business things’, so they can be named and used as terms themselves.
- enter business facts in the business vocabulary as ‘business things’, so they can be named and used as terms themselves.
- enter ‘conditions’ in the business vocabulary as ‘business things’, so they can be named and used as terms themselves.
- enter any term needed for any aspect of a given business area, including terms for things which will never have a representation in an information system.
- enter into the business vocabulary terms for specific (instance level) ‘things’ that are pre-defined and pre-identified, as needed.

6.5.3.2 *Architecture of a Business Vocabulary*

The proposal shall provide a means to

- specify the ‘essence/meaning/definition of things’ and the terms used to express the essence/meaning/definition as specific to a given community of business people.
- separate the specification of the ‘essence/meaning/definition of a thing’ from the specification of the means of expression, both the symbols / terms / identifiers and the form / syntax, by which that essence/meaning/definition will be communicated to other people.
- enable the use of *multiple* separate vocabularies in a single model.
- enable the integration of separate vocabularies from the same or multiple models. The mechanism of this integration is outside the scope of this RFP.
- capture properties of signifiers and support classification of signifiers by these properties
- allow the specification of rules that ensure the integrity and consistency of a particular set of signifiers within a business vocabulary.

- specify the 'scope' or context for a particular definition, or for a set of terms and definitions, in terms of the things of the business.
- define every 'thing', and the associated term(s) for it, that is needed to define any other 'thing' in the Business Vocabulary by any of the mechanisms specified in 6.5.3.3.

6.5.3.3 Definition mechanisms

Proposals shall provide support for different ways to define a term, including:

- provide a text definition
- provide a reference to a standard (published) lexicon, including natural language dictionaries, specialized glossaries for specific business communities, etc.
- provide a set of axioms on which to base a definition
- “description logic” definitions

6.5.3.4 Essence / Meaning of Things

The proposal shall provide a means to

- capture the essence/meaning of any given business thing– the clear understanding of it that is shared among members of a business community – in the form of textual and/or structured definitions (see 6.5.3.5).
- identify both particular business things and kinds of business things
- record multiple perspectives on, or perceptions of, a given business thing as things themselves.
- record roles of business things as things themselves.
- specify for a given thing whether it is perceived as an individual, discrete, identifiable thing or as a generalization or classification of things.
- specify for a given thing whether it is perceived as 'generic', or as having specific individuals as instances. That is, whether its 'instances' are quantified, like water, or distinguished, like trees.
- specify for a given thing whether it is perceived as ‘continuant’ (as existing, and possibly changing, over a period of time, such as a process) or ‘occurrent’ (as existing only at a point in time, such as an action or event)
- specify for a given thing whether it is perceived as having independent existence, or being dependent on the existence of some other thing(s)
- specify for a given thing whether it is perceived as unitary (not made up of parts) or composite (made up of parts)

- specify the interaction of two or more things in terms of the things involved and the effects of the interaction on the things involved.

6.5.3.5 Definitions

The proposed mechanisms supporting the specification of vocabulary shall provide a means to:

- record precise definitions, i.e. define the meaning/essence of every 'thing', in the same way using one construct where there is one and only one entry for each different 'thing' (meaning / essence) within a given business community.
- validate that any term used in a definition is also defined (or is term adopted from another vocabulary or natural language).
- illustrate definitions by example, both of particular things and specific facts.
- specify definitions as unstructured natural language statements of essence / meaning where the only connection with the thing being defined is at the whole statement level.
- specify structured, formal 'definitions' of the 'essence/meaning of a thing' where the elements of the formal definition are individually connected to other entries in the business vocabulary in a structured fashion.

6.5.3.6 Symbols, Terms & Identifiers used by Business People

The proposed mechanisms supporting the specification of vocabulary shall provide a means to:

- enter as Terms all specialized signifiers in the language of the community, including symbols, words, phrases, and identifiers, not just the words and phrases that are typically thought of as 'terms'.
- enter an unambiguous definition of every Term, given the business community using the Term and the subject context within which it is used.
- for a composite signifier – a signifier made up of distinguished component signifiers – specify both the 'essence of the thing' referred to by each part of the composite signifier, and the relation of the each part of the composite signifier to the particular thing to which the entire composite signifier makes reference.
- identify the community of speakers who use the symbol or term with the given defined meaning and context
- associate a symbol or term with alternate terms that may be used to express the essence of the term, possibly by different communities, e.g. in different natural languages.

6.5.3.7 *Business Taxonomies and Business Categorization Schemes*

The proposal shall provide a means to

- specify business taxonomies.
- specify business categorization schemes, and all the relations among all the parts, both generic and specific, of each categorization scheme.
- specify the states that a business thing can be in with respect to one of the real-world roles it plays.
- specify the states that a business thing can be in with respect to one of the perspectives from which it is defined.

6.5.4 Capture of Business Facts and Predicates

The proposal shall provide a means to

- specify facts (assertions) involving unary or n-ary predicates in which specific ‘things’ (instances) play the roles.
- specify facts (assertions) involving n-ary predicates in which the same ‘thing’ can play multiple roles.
- distinguish between a predicate (the verb phrase with placeholders in it) and an assertion (the predicate with some ‘thing’ playing each role in it) and allow both to be entries in the Business Vocabulary.
- associate a business thing with the business roles it may play
- associate a business thing with perceptions of it or perspectives on it.
- make an existence assertion for any business thing
- specify for each role a business thing may play whether open world or closed world logic is to be applied, i.e., whether failure to specify that a given business thing plays that role is to be interpreted as an assertion that that thing does not play that role (closed world), or interpreted as: it is not known whether that thing plays that role or not (open world).

6.5.5 Mapping to a business-friendly notation

The proposal shall specify a formal mapping from the syntactic objects of an existing business-friendly notation, such as RuleSpeak or ORM, to the constructs in the proposed metamodel.

Note – The objective of this requirement is to show that some notation that captures almost all of the semantic richness of business rules, as defined in 6.5.2, has an unambiguous mapping to the proposed metamodel. RuleSpeak and ORM are used as "business rules languages" in some business communities, but the

submitter is free to choose any language with similar expressive capabilities, so long as it has some published specification.

6.5.6 Mapping to the ISO Vocabulary Metamodel

The proposal shall specify a mapping from those elements of the proposed metamodel used to capture business vocabularies to the metamodel of vocabularies specified in ISO 1087-1:2000 Terminology work – Vocabulary – Part 1: Theory and application. The mapping shall preserve the semantics of the BRM notions to the extent possible.

6.5.7 XMI XML schema

The proposal shall specify the formal XML schema for exchange of rulesets, vocabularies, etc., that corresponds to the proposed metamodel, derived per XMI (see 6.3.1).

6.6 Optional Requirements

6.6.1 Business-friendly notation

As a proof of concept, submitters may propose one or more business-friendly notations (i.e. 'concrete syntax'), as described in 6.2.5, that would enable business people to express and communicate all kinds of Business Rules in a manner consistent with the metamodel.

Any proposed notation should have an unambiguous mapping to the proposed metamodel.

Any proposed notation should allow the use of signifiers defined in a vocabulary model that is an instance of the proposed vocabulary metamodel.

Any proposed notation should allow multiple assertion readings, one for each different sequence of the roles in the predicate on which the assertion is based.

The business-friendly notation will not be part of the proposed normative specification, but will provide valuable guidance for tool vendors and others wishing to create their own business-friendly notation.

6.6.2 Implementation mapping

Proposals may provide an illustration of how a business rule expressed at the MDA Business Model level may be mapped to a particular class of platform at the MDA PIM level. The mapping will not be part of the proposed normative

specification, but will provide valuable guidance for tool vendors and others wishing to create their own mappings.

6.7 Issues to be discussed

The following issues will be considered during submission evaluation. They should not be part of the proposed normative specification. (Place discussions of them in Part I of the submission.)

- 6.7.1 Proposals shall discuss how their representation of formal logic lays the foundation for transforming business rules for business people into implementations of business rules in automated systems.
- 6.7.2 Proposals shall provide the rationale for the design of the definition of Vocabularies and explain why the metamodel's treatment of business vocabulary is optimal from a business point of view, given likely scenarios of usage.
- 6.7.3 Proposals shall provide the rationale for excluding any parts of the ISO 1087-1 Terminology Standard not adopted.
- 6.7.4 Proposals shall discuss the relationship of the proposed standard for capturing business semantics of business rules to other business model elements that may be the subject of later RFPs for business modeling.
- 6.7.5 Proposals shall discuss how to transform definitions of terms from sources such as:
- Object Role Model (ORM)
 - Entity relationship diagram
 - UML class diagrams
 - Ontology (OWL/DL)
 - RDF
- into Vocabulary definitions.
- 6.7.6 Proposals shall explain how a rule expressed in the recommended fashion can be evaluated as a logical function, assuming that values are given for any terms that are referred to in a rule.

6.8 Evaluation Criteria

Additional criteria by which proposals will be evaluated are:

- 6.8.1 The clarity with which the concepts expressed in the identified 'business-friendly' notation(s) are captured in the proposed metamodel, i.e. the degree to which the metamodel enables the expression of the captured rules in terms business people can readily understand.
- 6.8.2 The ease in which the proposed solution is integrated with ISO Terminology and Thesauri standards.
- 6.8.3 The ease with which the proposed solution accommodates all natural languages commonly used in the running of enterprises wherever natural language is used in the proposed notation solution.

6.9 Other information unique to this RFP

none.

6.10 RFP Timetable

The timetable for this RFP is given below. Note that the TF or its parent TC may, in certain circumstances, extend deadlines while the RFP is running, or may elect to have more than one Revised Submission step. The latest timetable can always be found at the *OMG Work In Progress* page at www.omg.org/schedules/ under the item identified by the name of this RFP.

Duration	Event or Activity	Actual Date
	<i>Preparation of RFP by TF</i>	
	<i>RFP placed on OMG document server</i>	<i>May 12, 2003</i>
	<i>Approval of RFP by Architecture Board Review by TC</i>	
<i>0</i>	<i>TC votes to issue RFP</i>	<i>June 6, 2003</i>
<i>180</i>	<i>LOI to submit to RFP due</i>	<i>December 8, 2003</i>
<i>225</i>	<i>Initial Submissions due and placed on OMG document server (“Three week rule”)</i>	<i>January 12, 2004</i>
<i>250</i>	<i>Voter registration closes</i>	<i>February, 2004</i>
<i>265</i>	<i>Initial Submission presentations</i>	<i>February, 2004</i>
	<i>Preliminary evaluation by TF</i>	

415	<i>Revised Submissions due and placed on OMG document server (“Three week rule”)</i>	<i>July, 2004</i>
445	<i>Revised Submission presentations</i>	<i>August, 2004</i>
	<i>Final evaluation and selection by TF</i>	
	<i>Recommendation to AB and TC</i>	
	<i>Approval by Architecture Board</i>	
	<i>Review by TC</i>	
475	<i>TC votes to recommend specification</i>	<i>September, 2004</i>
565	<i>BoD votes to adopt specification</i>	<i>December, 2004</i>

Appendix A References and Glossary Specific to this RFP

A.1 References Specific to this RFP

- [1] *Organizing Business Plans: The Standard Model for Business Rule Motivation*, the Business Rules Group, 2002, available at http://www.businessrulesgroup.org/second_paper/BRG-BRMM.pdf.
- [2] *New Oxford Dictionary of English*, Oxford University Press, 2001 (NODE).
- [3] *Defining Business Rules ~ What are they really?*, GUIDE Business Rules Project Final Report, July, 2000, available at: http://www.businessrulesgroup.org/first_paper/br01c0.htm
- [4] *Merriam-Webster’s New Collegiate Dictionary*, 9th Edition, Merriam-Webster, 1986.
- [5] *Merriam Webster Dictionary of Synonyms*

A.2 Glossary Specific to this RFP

BRM = Business Rules Metamodel (subject of this RFP)

Business Process = a series of actions or steps taken in order to achieve a particular business end

Business Rule = a guide covering conduct, action, practice or procedure within a particular business activity or business sphere. (see 6.1.1). Fact = a proposition that is asserted to be true

Perspective = a particular way in which some thing may be considered: a particular part or feature of it; a point of view on a business thing.

Ruleset = any collection of business rules grouped together for some purpose (see 6.2.9).

Rule template = a structured collection of atomic business rules, in which the structure itself conveys an important semantic relationship among the atomic rules. E.g. a decision table, a decision tree.

Signifier = a sign's physical form (such as a sound, printed word, or image) as distinct from its meaning.

Thing = "That which has actual, distinct and demonstrable existence outside of the mind, not restricted to direct knowledge through the senses, but including that for which its existence is inferred from its signs or effects"[5].

(Latin core term, *'res'*) Whatsoever – literally anything that exists external to the mind of the thinker (including that which exists as an idea formulated in the mind of another thinker); literally anything which can be talked about. A 'thing' can be either tangible (animal, vegetable or mineral) or intangible; specific (a particular) or generic (a concept, a universal); unitary or composite; lexical or non-lexical; an event or an enduring thing; and whether or not its existence is perceived as continuing independently from the existence of other things.

There is no adequate word in English for this core concept. In English, 'thing', taken in its very broadest sense, is the closest word. The all-inclusive nature of this is most closely indicated by: 'anything', everything, something, and all things.