

Object Management Group

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Web Services for Enterprise Collaboration (WSEC)

An EDOC technology mapping

Request For Proposal

OMG Document: mars/2002-06-06

Letters of Intent due: August 28th 2002

Submissions due: October 28th 2002

Objective of this RFP

Internet technologies are quickly becoming a highly accepted mechanism for enterprise collaboration, enabling business to business and department to department integration of business processes. WSDL and Soap have emerged as the accepted standard for enabling communication in support of system to system communication over Internet media. However, WSDL is not intended to express richer semantics of collaboration.

The Enterprise Collaboration Architecture (ECA) adopted as part of OMG-EDOC describes semantics of collaboration and how collaborations can drilldown into the enterprise systems and supporting applications. Utilizing the Model Driven Architecture, ECA is intended to support and integrate multiple technologies and forms of expressions based on high-level UML models and the MDA Vision.

This RFP provides for a two-way mapping between the Component Collaboration Architecture (CCA) portion of ECA and WSDL such that enterprise collaborations described in CCA can be implemented with WSDL, XML Schema and Soap. It also describes how existing WSDL services are represented in UML using CCA. This enables high-level and business focused collaborations to be automatically and deterministically mapped to web services infrastructures. It also allows existing services to be made part of new CCA collaborations.

This RFP solicits proposals for the following:

- A Mapping from EDOC-Component Collaboration Architecture to XML-Schema and unbound WSDL 1.1 with a SOAP binding.
- A Mapping from XML-Schema and WSDL 1.1 with an optional Soap binding to the EDOC-Component Collaboration Architecture.
- Any required extensions to the EDOC-Component Collaboration Architecture to represent WSDL semantics.

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 like OMG IDL[IDL], CORBA[CORBA], Realtime CORBA [CORBA], GIOP/IIOP[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*

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.

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, facilitating integration and interoperability and supporting 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 it on a specific platform, and hence possibly contains artifacts-elements that are specific to the platform.
5. Mapping – Specification of a mechanism for transforming the artifacts-elements of a model conforming to a particular metamodel into artifacts-elements of another model that conforms to another (possibly the same) metamodel. They-A mapping may be expressed

as associations, constraints, rules, templates with values that must be chosen 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. 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 relative to the CORBA platform, 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 the Relational Data Model), 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 is adopted by OMG, it is made available for use by both OMG members and non-members alike.

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].

3.2 Rôle of Board of Directors

The OMG Board of Directors (BoD) votes to formally adopt specifications on behalf of OMG. Each OMG Technology Committee (TC) (Domain and Platform) and Architecture Board (AB) provides technical guidance to the BoD. In addition, the Business Committee (BC) of the BoD provides guidance to ensure that implementations of adopted specifications are made commercially available.

3.3 Rôle of Technology Committees and Architecture Board

Submissions to RFPs are evaluated by the Task Force (TF) that initiated the RFP. Selected specifications are *recommended* to the parent TC after being reviewed by the Architecture Board for consistency with MDA. The parent TC then votes to *recommend adoption* to the OMG BoD.

3.4 **Rôle of Task Forces**

The role of the initiating TF is to technically evaluate submissions and select one or more specifications that satisfy the requirements of the RFP. The process typically takes the following form:

- **Voter Registration**

Interested TF members may register to participate in specification selection votes for an 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. Companies who have submitted an LOI are automatically registered to vote.

- **Letter of Intent (LOI)**

A Letter of Intent (LOI) must be submitted to the OMG Business Committee signed by an officer of an 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. (See section 4.3 for more information.)

- **Initial Submissions**

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

- **Initial Review Phase**

A period of approximately 120 days follows during which the TF reviews the Initial Submissions. During this time submitting companies have the opportunity to revise and/or merge their Initial Submissions, if they so choose.

- **Revised Submissions**

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

- **Selection Votes**

When the registered voters of the TF 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 Architecture Board (AB), which reviews the proposal for MDA compliance and technical merit. A recommendation to adopt from the AB moves the voting process into the issuing Task Force's parent 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 made by the BoD and is made on technical merit as well as business qualifications.

- Finalization

A Finalization Task Force (FTF) is chartered by the issuing Task Force's parent Technical Committee to prepare an adopted submission for publishing as a formal, publicly available specification.

- Revision

A Revision Task Force (RTF) is normally chartered after formally publishing a specification to manage issues filed against it by implementers and users. The output of the RTF is either a revised specification reflecting minor technical changes, recommendations for issuance of new RFPs, or both.

3.5 Goals of the evaluation

The primary goals of the TF evaluation process are to:

- Provide a fair and open process
- Facilitate critical review of the submissions by all members of the TF
- 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 actively to 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 an organization must be a Platform or Contributing member 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

Unlike a response to an OMG Request For Information (RFI), 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/98-03-01.

<___ 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 [BCQ].

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 demonstration of 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 features identified 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 confidentiality 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 issuing TF 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, FrameMaker, 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 Models submitted in response to this RFP shall be specified in UML or another of the modeling technologies and extension mechanisms adopted by OMG subject to any further constraints on the types of the models and the modeling technologies specified in Section 6 of this RFP. Submitters may use an alternative, non-OMG-adopted modeling technology only if they describe, and provide a rationale for, the techniques, notation and terminology they use. Models specified in OMG UML [UML] shall be accompanied by an OMG XMI [XMI] representation (including a machine-readable copy), suitable for import into UML design tools. A best effort should be made to provide OMG XMI representation even in those cases where models are presented using alternative notations and techniques.
- 5.1.2 In general, proposals shall be expressed in any combination of a PIM, a PSM, and all associated information required for both automatic and manual mappings from the PIM to the PSM. However, section 6 of this RFP may contain more specific requirements on models to be submitted.
- 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) that 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; however proposals may specify constraints on object behavior that implementations need to take into account over and above those defined by the interface semantics.
- 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 objects that are introduced by the proposal?
- Which accesses to security-sensitive objects 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 objects introduced by the proposal? Of what security considerations must the implementers of your proposal be aware?

OMG's CORBAsecurity Specification [SEC] is a useful resource in providing guidance in formulating responses.

5.1.14 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 outside of a context in which the customs of the specified region(s) are being consistently 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, 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

Collaboration is the cornerstone of modern business, the agile enterprise must be able to understand its business collaborations and facilitate these collaborations using their information systems. The Enterprise Collaboration Architecture provides a way to model these enterprise collaborations in UML and capture the business semantics of the collaborations and sub-collaborations within and between enterprises. What are required are technologies to implement these collaborations in open and standard ways to provision solutions quickly to integrate existing systems as well as provide new functionality. These collaborations must function across both technical and business boundaries and must be resilient to business and technology change. The Model Driven Architecture provides a path to realize these goals quickly while creating and maintaining a long-term architecture and software asset.

WSDL, XML-Schema and associated technologies such as SOAP provide a solid foundation for system to system communication. The ability for systems to integrate with only a communications connection and a WSDL specification has realized open distributed computing with broad acceptance. However, WSDL is technology focused and falls short when viewed as a way to specify collaborative business processes. In addition, as a technology focused specification WSDL is subject to rapid change and may be only one of the technologies employed in a multi-enterprise solution composed of divergent systems.

Multiple “add on” forms of specification are being proposed for WSDL, such as WSFL, Xlang and WSCL. Since CCA provides a higher level representation of collaborative semantics it can serve to bridge between these extensions as they evolve over time.

By providing a model based (MDA) approach to enterprise collaboration implemented using WSDL we will have substantially improved the state of the art with respect to;

- High level support for understanding and documenting collaborative business processes.
- Loose coupling between independent parties in a collaboration
- Tighter cohesion in the software development life-cycle between design and implementation processes and artifacts.

- Consistency in the way WSDL is used to implement collaboration.
- A standard way to use UML for web services WSDL specifications.
- Enhanced WSDL support for asynchronous interactions based on CCA semantics.
- Automation of the development process from design to implementation.
- Faster, more deterministic development processes.
- Ability to adapt to changing business requirements.
- Ability to adapt to multiple and changing infrastructure technologies.
- Full life-cycle tool support

6.2 Scope of Proposals Sought

This RFP solicits proposals for specification of translation rules that enable the following:

- To map collaborations specified with the CCA into one or more WSDL and SCHEMA documents.
- To map WSDL and SCHEMA documents into CCA.
- To provide extensions as required to the CCA Meta-Model to hold WSDL and XML-Schema (Structure and data-type) semantics.

Submitters need to specify the versions of EDOC, WSDL and SCHEMA supported by their submission.

6.3 Relationship to Existing OMG Specifications

UML for EDOC - [PTC/02-02-05](#), in finalization status.

UML 1.4 -

<http://www.omg.org/technology/documents/formal/uml.htm>

XML Production of XML Schema – PTC/01-12-03

CWM Web Services Unisys & IBM Initial Submission – ad/01-10-07

WSDL/Soap to Corba Interworking RFP – ORBOS/02-01-14

6.4 Related Documents and Standards

W3C WSDL - <http://www.w3.org/TR/wsdl>

W3C Schema (Structures) - <http://www.w3.org/TR/xmlschema-1/>

W3C Schema (Data-types) - <http://www.w3.org/TR/xmlschema-2/>

ebXML – www.ebxml.org

6.5 Requirements

- 6.5.1 Submissions shall specify complete mapping rules enabling translation of the applicable features of a CCA Meta-Model specification to a valid set of XML-Schema (Structures and data types) and WSDL service definitions not bound to any technology. Submissions shall specify the features of CCA applicable to XML-Schema and WSDL.
- 6.5.2 Submissions shall specify complete mapping rules enabling translation of the applicable features of a CCA Meta-Model specification to a valid set of XML-Schema (Structures and data types) and WSDL service definitions bound to Soap.
- 6.5.3 Submissions shall specify which version(s) of WSDL, Schema, Soap and EDOC they support.
- 6.5.4 To the extent possible, submissions shall specify complete and isomorphic mapping rules enabling translation of all of the features of a valid WSDL specification with referenced XML-Schema to a CCA Meta-Model specification. This mapping may impose some restrictions on XML-Schema data types, such limitations must be fully specified.
- 6.5.5 Submissions shall specify all extensions to CCA required to comply with requirement (6.5.4).

6.6 Special Modeling Requirements

The MOF 2.0 Query/View/Transform RFP may standardize specification of mapping. Should such standard facilities be adopted at the time of submission such facilities should be used to express the

mappings in this RFP. Submitters should be aware of and track the progress of this RFP.

6.7 Requests

6.7.1 Facilitating Mapping

As this is the first ECA mapping RFP, Submissions may require and provide enhanced mechanisms or methodologies for augmenting ECA specifications with mapping parameters and technology specific semantics.

6.7.2 Normative WSDL tags.

Proposals may specify additional tags or comments for WSDL to better facilitate round-trip engineering between CCA and WSDL. These tags or comments shall not invalidate or otherwise interfere with systems that do not understand them.

6.7.3 Additional ECA profiles

Proposals may specify mappings for other ECA profiles in addition to the CCA profile.

6.8 Issues to be discussed

6.8.1 Proposals shall include information relative to future support for evolving WSDL “flow” languages.

6.8.2 Proposals shall discuss how their solution may augment or be integrated with other standards activities such as ebXML or JSR-159.

6.8.3 In that the XML-Schema type system is open ended, Proposals shall discuss any limitations imposed on type specifications.

6.9 Evaluation Criteria

In addition to the above requirements, the members of the Task Force are likely to use the following criteria when evaluating the submissions to this RFP:

Independence

Ability for WSDL endpoints specified with CCA to inter-work with another without each having prior knowledge of the other's implementation.

Completeness

Preservation of content and semantics between transformations.

Ease of use

The solution should, to the greatest extent possible, be easy to use and understand.

6.10 Other information unique to this RFP

None

6.11 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 within the RFP Template on the Template Downloads page [FORMS] of OMG's Web site. Note that "<month>" and "<approximate month>" is the name of the month spelled out; e.g., January.

Duration	Event or Activity	Actual Date
	<i>Preparation of RFP by TF</i>	
	<i>RFP placed on OMG document server</i>	<i>June 3rd</i>
	<i>Approval of RFP by Architecture Board Review by TC</i>	<i>June 27th 2002</i>
<i>0</i>	<i>TC votes to issue RFP</i>	<i>June 28th 2002</i>
<i>60</i>	<i>LOI to submit to RFP due</i>	<i>Aug 28th 2002</i>
<i>113</i>	<i>Initial Submissions due and placed on OMG document server ("Three week rule")</i>	<i>Oct 28th 2002</i>
<i>141</i>	<i>Initial Submission presentations</i>	<i>Nov 21st 2002</i>
<i>134</i>	<i>Voter registration closes</i>	<i>Nov 30th 2002</i>

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<i>240</i>	<i>Revised Submissions due and placed on OMG document server ("Three week rule")</i>	<i>Jan 6th, 2003</i>
<i>261</i>	<i>Revised Submission presentations</i>	<i>Jan 28th, 2003</i>
	<i>Final evaluation and selection by TF Recommendation to AB and TC</i>	
	<i>Approval by Architecture Board Review by TC</i>	
<i>330</i>	<i>TC votes to recommend specification</i>	<i>March 2003</i>
<i>360</i>	<i>BoD votes to adopt specification</i>	<i>April 2003</i>

Appendix A References and Glossary

A.1 References

The following documents are referenced in this document:

[ATC] Air Traffic Control Specification 1.0,
http://www.omg.org/technology/documents/formal/air_traffic_control.htm

[BCQ] OMG Board of Directors Business Committee Questionnaire,
<http://www.omg.org/cgi-bin/doc?bc/02-02-01>

[CCM] CORBA Core Components Specification,
http://www.omg.org/techprocess/meetings/schedule/Components_December_2000_FTF.html

[CORBA] Common Object Request Broker Architecture
(CORBA/IIOP),
http://www.omg.org/technology/documents/formal/corba_iiop.htm

[CWM] Common Warehouse Metamodel Specification,
<http://www.omg.org/technology/documents/formal/cwm.htm>

[DAIS] Data Acquisition from Industrial Systems,
<http://www.omg.org/cgi-bin/doc?dai/2001-07-03>

[EDOC] UML Profile for EDOC Specification,
http://www.omg.org/techprocess/meetings/schedule/UML_Profile_for_EDOC_FTF.html

[EJB] "Enterprise JavaBeans™",
<http://java.sun.com/products/ejb/docs.html>

[FORMS] Download of OMG templates and forms,
http://www.omg.org/technology/template_download.htm

[GE] Gene Expression, <http://www.omg.org/cgi-bin/doc?dai/2002-02-04>

[GLS] General Ledger Specification 1.0,
http://www.omg.org/technology/documents/formal/gen_ledger.htm

[Guide] The OMG Hitchhiker's Guide, Version 6.1,
<http://www.omg.org/cgi-bin/doc?omg/2002-03-03>

[IDL] ISO/IEC 14750 also see [CORBA] Chapter 3.

[IDLC++] IDL to C++ Language Mapping,
<http://www.omg.org/technology/documents/formal/c++.htm>

[MDAa] OMG Architecture Board, "Model Driven Architecture - A Technical Perspective", <http://www.omg.org/mda/papers.htm>

[MDAb] "Developing in OMG's Model Driven Architecture (MDA)," <http://www.omg.org/cgi-bin/doc?omg/2001-12-01>

[MDAc] "MDA Guide" (to be published)

[MDAd] "MDA "The Architecture of Choice for a Changing World™", <http://www.omg.org/mda>

[MOF] Meta Object Facility Specification, Version 1.3.1,
<http://www.omg.org/technology/documents/formal/mof.htm>

[MQS] "MQSeries Primer",
<http://www.redbooks.ibm.com/redpapers/pdfs/redp0021.pdf>

[NS] Naming Service,
http://www.omg.org/technology/documents/formal/naming_service.htm

[OMA] "Object Management Architecture™",
<http://www.omg.org/oma/>

[OTS] Transaction Service,
http://www.omg.org/technology/documents/formal/transaction_service.htm

[P&P] Policies and Procedures of the OMG Technical Process,
<http://www.omg.org/cgi-bin/doc?pp>

[PIDS] Personal Identification Service,
http://www.omg.org/technology/documents/formal/person_identification_service.htm

[RM-ODP] ISO/IEC 10746

[SEC] CORBA Security Service,
http://www.omg.org/technology/documents/formal/security_service.htm

[TOS] Trading Object Service,
http://www.omg.org/technology/documents/formal/trading_object_service.htm

[UML] Unified Modeling Language Specification,
<http://www.omg.org/technology/documents/formal/uml.htm>

[XMI] XML Metadata Interchange Specification, Version 1.2,
<http://www.omg.org/technology/documents/formal/xmi.htm>

[XML/Value] XML Value Type Specification, <http://www.omg.org/cgi-bin/doc?ptc/2001-04-04>

These documents (and information about the OMG in general) can be obtained from the OMG's web site (<http://www.omg.org>). Documents may also be obtained by contacting OMG at documents@omg.org. 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.

A.2 Glossary

Architecture Board (AB) - The OMG plenary that is responsible for ensuring the technical merit and MDA-compliance of RFPs and their submissions.

Board of Directors (BoD) - The OMG body that is responsible for adopting technology.

Common Object Request Broker Architecture (CORBA) - An OMG distributed computing platform specification that is independent of implementation languages.

Common Warehouse Metamodel (CWM) - An OMG specification for data repository integration.

CORBA Component Model (CCM) - An OMG specification for an implementation language independent distributed component model.

Interface Definition Language (IDL) - An OMG and ISO standard language for specifying interfaces and associated data structures.

Letter of Intent (LOI) - A letter submitted to the OMG BoD's Business Committee signed by an officer of an 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.

Mapping - Specification of a mechanism for transforming the artifacts elements of a model conforming to a particular metamodel into artifacts elements of another model that conforms to another (possibly the same) metamodel.

Metadata - Data that represents models. For example, a UML model; a CORBA object model expressed in IDL; and a relational database schema expressed using CWM.

Metamodel - A model of models.

Meta Object Facility (MOF) - An OMG standard, closely related to UML, that supports metadata management and language definition.

Model - A formal specification of the function, structure and/or behavior of an application or system.

Model Driven Architecture (MDA) - An approach to IT system specification that separates the specification of functionality from the specification of the implementation of that functionality on a specific technology platform.

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.

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.

Platform Specific Model (PSM) - A model of a subsystem that includes information about the specific technology that is used in the realization of it on a specific platform, and hence possibly contains artifacts elements that are specific to the platform.

Request for Information (RFI) - A general request to industry, academia, and any other interested parties to submit information about a particular technology area to one of the OMG's Technical Committee subgroups.

Request for Proposal (RFP) - A document requesting OMG members to submit proposals to the OMG's Technical Committee. Such proposals must be received by a certain deadline and are evaluated by the issuing task force.

Task Force (TF) - The OMG Technical Committee subgroup responsible for issuing a RFP and evaluating submission(s).

Technology Committee (TC) - The body responsible for recommending technologies for adoption to the BoD. There are two TCs in OMG – *Platform TC* (PTC) and *Domain TC* (DTC), that focus on IT infrastructure related standards and domain specific standards respectively.

Unified Modeling Language (UML) - An OMG standard language for specifying the structure and behavior of systems. The standard defines an abstract syntax and a graphical concrete syntax.

UML Profile - A standardized set of extensions and constraints that tailors UML to particular use.

XML Data Interchange (XMI) - An OMG standard that facilitates interchange of UML models and other more general models related information via XML documents.

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