Object Management Group

First Needham Place
250 First Avenue, Suite 201
Needham, MA 02494

Telephone: +1-781-444-0404
Facsimile: +1-781-444-0320

Account Receivable – Account Payable AR/AP Facility

Request For Proposal

OMG Document: finance/01-04-04

Submissions due: August 20, 2001

Objective of this RFP

The Account Receivable / Account Payable (AR / AP) Facility defines the interfaces, and their semantics, that are required to enable interoperability between AR / AP systems and general ledgers, sales and purchasing systems, and other distributed objects and applications for accounting purposes.

This RFP solicits proposals for the following:

- AR / AP Facility

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 a membership of over 800 vendors, developers, and end users. Established in 1989, its mission is to promote the theory and practice of Object Technology (OT) for the development of distributed computing systems.

A key goal of OMG is create a standardized object-oriented architectural framework for distributed applications based on specifications that enable and support distributed objects. Objectives include the *reusability*, *portability*, and *interoperability* of object-oriented software components in heterogeneous environments.To this end, the OMG adopts interface and protocol specifications, based on commercially available object technology, that together define an Object Management Architecture (OMA).

1.2 Organization of this document

The remainder of this document is organized as follows:

Chapter 2 - *Architectural Context* - background information on OMG's Object Management 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, mandatory and optional requirements, issues to be discussed, evaluation criteria, and timetable that apply specifically to this RFP.

Additional RFP-specific chapters may also be included following Chapter 6.

1.3 References

The following documents are referenced in this document:

Richard Soley (ed.), *Object Management Architecture Guide,* Third Edition, Wiley, June 1995. OMG Document ab/97-05-05, or successor.

The Common Object Request Broker: Architecture and Specification, Revision 2.1, August 1997. OMG Document formal/97-09-01, or successor.

CORBAservices: Common Object Services Specification, Revised Edition, July 1997. OMG Document formal/97-07-04, or successor.

CORBAfacilities Architecture, Revision 4.0, November 1995.

Business Committee RFP Attachment, OMG Document omg/97-10-01.

Policies and Procedures of the OMG Technical Process, OMG Document pp/97-06-01 or successor.

These documents can be obtained by contacting OMG at document@omg.org. Many OMG documents, including this document, are available electronically from OMG's document server. Send a message containing the single line "help" to server@omg.org for more information, or visit the OMG Web page (URL http://www.omg.org/), which also has more information about OMG in general. If you have general questions about this RFP send email to responses@omg.org.

2.0 Architectural Context

2.1 Object Management Architecture

The *Object Management Architecture Guide* (OMAG) describes OMG's technical objectives and terminology and provides the conceptual infrastructure upon which supporting specifications are based. The guide includes the *OMG Object Model,* which defines common semantics for specifying the externally visible characteristics of objects in a standard implementation-independent way, and the *OMA Reference Model.*

The Reference Model identifies and characterizes the components, interfaces, and protocols that compose the OMA. This includes the Object Request Broker (ORB) component that enables clients and objects to communicate in a distributed environment, and four categories of object interfaces:

- *Object Services* are interfaces for general services that are likely to be used in any program based on distributed objects.
- *Common Facilities* are interfaces for horizontal end-user-oriented facilities applicable to most application domains.
- *Domain Interfaces* are application domain-specific interfaces.
- *Application Interfaces* are non-standardized application-specific interfaces.

A second part of the Reference Model introduces the notion of domain-specific *Object Frameworks.* An Object Framework component is a collection of cooperating objects that provide an integrated solution within an application or technology domain and which is intended for customisation by the developer or user.

Through a series of RFPs, OMG is populating the OMA with detailed specifications for each component and interface category in the Reference Model. Adopted specifications include the Common Object Request Broker Architecture (CORBA), CORBAservices, and CORBAfacilities.

The wide-scale industry adoption of OMG's OMA provides application developers and users with the means to build interoperable software systems distributed across all major hardware, operating system, and programming language environments.

2.2 CORBA

The *Common Object Request Broker Architecture* defines the programming interfaces to the OMA ORB component. An ORB is the basic mechanism by which objects transparently make requests to - and receive responses from - each other on the same machine or across a network. A client need not be aware of the mechanisms used to communicate with or activate an object, how the object is implemented, nor where the object is located. The ORB thus forms the foundation for building applications constructed from distributed objects and for interoperability between applications in both homogeneous and heterogeneous environments.

The *OMG Interface Definition Language* (IDL) provides a standardized way to define the interfaces to CORBA objects. The IDL definition is the contract between the implementor of an object and the client. IDL is a strongly typed declarative language that is programming language-independent. Language mappings enable objects to be implemented and sent requests in the developer's programming language of choice in a style that is natural to that language.

CORBA 2.0 is an extension and restructuring of the earlier CORBA 1.2 specification. CORBA 2.0 is a family of specifications consisting of the following components:

- Core (including IDL syntax and semantics)
- Interoperability
- An expanding set of language mappings, including:

  C
  C++
  SmallTalk
  Ada95
  COBOL

Each component is a separate compliance point. The minimum required for a CORBA-compliant implementation is adherence to the core and one language mapping.

2.3 CORBA/Interoperability

Interoperability between CORBA-compliant ORBs is provided by OMG's *Internet Inter-ORB Protocol* (IIOP). Adopted in December 1994 as the mandatory CORBA 2.0 protocol for “out of the box” interoperability, IIOP is the TCP/IP transport mapping of a *General Inter-ORB Protocol*

(GIOP). IIOP enables requests to be sent to networked objects managed by other ORBs in other domains.

The OMG interoperability architecture also accommodates communication using optional *Environment-Specific IOPs* (ESIOPs), the first of which is the DCE-CIOP.

2.4 CORBAservices

Object Services are general purpose services that are either fundamental for developing useful CORBA-based applications composed of distributed objects, or that provide a universal - application domain-independent - basis for application interoperability.

Object Services are the basic building blocks for distributed object applications. Compliant objects can be combined in many different ways and put to many different uses in applications. They can be used to construct higher level facilities and object frameworks that can interoperate across multiple platform environments.

Adopted OMG Object Services are collectively called CORBAservices and include Naming, Events, LifeCycle, Persistent Object, Relationships, Externalization, Transactions, Concurrency Control, Licensing, Query, Properties, Security, Time, Collections, and Trading Services.

2.5 CORBAfacilities

Common Facilities are interfaces for horizontal end-user-oriented facilities applicable to most domains. Adopted OMG Common Facilities are collectively called CORBAfacilities and include an OpenDoc-based Distributed Document Component Facility.

A specification of a Common Facility or Object Service typically includes the set of interface definitions - expressed in OMG IDL - that objects in various roles must support in order to *provide*, *use*, or *participate in* the facility or service. As with all specifications adopted by OMG, facilities and services are defined in terms of interfaces and their semantics, and not a particular implementation.

2.6 Object Frameworks and Domain Interfaces

Unlike the interfaces to individual parts of the OMA “plumbing” infrastructure, Object Frameworks are complete higher level components that provide functionality of direct interest to end-users in particular

application or technology domains. They are vertical slices down the OMG “interface stack”.

Object Frameworks are collections of cooperating objects categorized into *Application, Domain, Facility,* and *Service Objects*. Each object in a framework supports (through interface inheritance) or makes use of (via client requests) some combination of Application, Domain, CORBAfacilities, and CORBAservices *interfaces*.

A specification of an Object Framework defines such things as the structure, interfaces, types, operation sequencing, and qualities of service of the objects that make up the framework. This includes requirements on implementations in order to guarantee application portability and interoperability across different platforms.

Domain Task Force RFPs are likely to focus on Object Framework specifications that include new Domain Interfaces for application domains such as Finance, Healthcare, Manufacturing, Telecom, Electronic Commerce, and Transportation.

3.0 Adoption Process

3.1 Introduction

OMG adopts specifications for interfaces and protocols by explicit vote on a technology-by-technology basis. The specifications selected each fill in a portion of the OMA Reference Model. 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.

For more detailed information on the adoption process see the *Policies and Procedures of the OMG Technical Process*.

3.2 Rôle of Board of Directors

The OMG Board of Directors votes to formally adopt specifications on behalf of OMG. The OMG Technology Committees (Domain and Platform TCs) and Architecture Board (AB) provide technical guidance to the Board of Directors. In addition, the Business Committee of the Board 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 TC 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 the OMA. The full TC then votes to *recommend adoption* to the OMG Board.

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.

- 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 full and complete proposals and working implementations of the proposed specifications are expected to exist at the time of submission.

- Evaluation Phase

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

- Revised Submissions

  Final revised submissions are due by a specified deadline. Submitters again normally present their proposals at the next following meeting of the TF. Finalists may be requested to demonstrate implementations of their proposal.

- Selection Vote

  When the registered voters of the TF believe that they sufficiently understand the relative merits of the revised submissions, a specification selection vote is taken.

3.5 Goals of the evaluation

The primary goals of the TF evaluation process are to:

- Provide a fair and open process
- Force a critical review of the submissions and discussion by all members of the TF
- Give feedback to allow submitters 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

Submissions to this RFP may only be made by Platform, Domain or Contributing members of the OMG. To submit to an RFP issued by the Platform Technology Committee an organisation must be a Platform or Contributing member at 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 organisations 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 organisations concerned.

4.2 Submission Effort

Unlike a submission to an OMG Request For Information (RFI), an RFP submission may require significant effort in terms of document preparation, presentations to the initiating 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 your organization signifying your intent to respond to the RFP and confirming your 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 your organization for receipt of all subsequent information regarding this RFP and your 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 <___organisation required___> (the organisation) 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 organisation and has the approval and authority to make this commitment on behalf of the organisation.

<___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, available separately as document omg/98-03-01, was approved by the OMG Board in February 1998.

Commercial considerations in OMG technology adoption

A1 Introduction

OMG wishes to encourage rapid commercial adoption of the specifications 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 Committee; 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 organisations. Pre-product implementations are acceptable. Since use of OMG specifications should

not be dependant 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.*
- *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 organisations 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.

A2.3 Access to Intellectual Property Rights

OMG will not adopt a specification 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 of such specification, unless OMG believes that such IPR owner will grant a license to implementers (whether OMG members or not) on non-discriminatory and commercially reasonable terms which wish to implement the specification. Accordingly, the submitter must certify that it is not aware of any claim that the specification 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 implementation "as is". If the submitter owns IPR to which an implementation of a specification 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 implementer on non-discriminatory and commercially reasonable terms, to permit development and commercialisation of an implementation that includes such IPR.

It is the goal of the OMG to make all of its specifications 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 implementation of the specification.

A2.4 Publication of the specification

Should the submission be adopted, the submitter must grant OMG (and its sublicensees) a world-wide, royalty-free licence 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 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 Separate proposals

Unless otherwise indicated in Chapter 6, independent proposals are solicited for each separate item in the RFP. Each item is considered a separate architectural entity for which a proposal may be made. A submitter may respond to any or all items. Each item will be evaluated independently by the initiating TF. Submissions that do not present clearly separable proposals for multiple items may therefore be at a disadvantage.

It should be noted that a given technology (e.g. software product) may support two or more RFP items. So long as the interfaces for each item are separable, this is not precluded.

4.5.2 Complete proposals

Proposals for each separate RFP item must be complete. A submission must propose full specifications for each item and address all the relevant general and specific requirements detailed in this RFP.

4.5.3 Additional specifications

Submissions may include additional specifications for items not covered by the RFP which 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.

4.5.4 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 within the OMA 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 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 the technical viability of their proposal. OMG will favour proposals based on technology for which sufficient relevant experience has been gained in CORBA-based or comparable environments.

4.9 Format of RFP Submissions

This section provides guidance on how to structure your 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.
- The models and terminology in the *Object Management Architecture Guide* and *CORBA* should be used in your submission. Where you believe this is not appropriate, describe and provide a rationale for the models and terminology you believe OMG should use. Submitters are encouraged to document their object models and designs using OMG UML where appropriate, and to supply an OMG XMI representation of the design (including a machine-readable copy) for

the convenience of those wishing to import the UML model into design tools.

4.9.2 Suggested Outline

A three part structure for submissions is suggested:

PART I

- Copyright Waiver (see 4.5)
- Submission contact point (see 4.2)
- Overview or guide to the material in the submission
- Overall design rationale (if appropriate)
- Statement of proof of concept (see 4.6)
- Resolution of RFP mandatory and optional requirements

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

  In addition, if your 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

PART III

- Summary of optional versus mandatory interfaces

  Submissions must clearly distinguish interfaces that all implementations must support from those that may be optionally supported.

- Proposed compliance points

  Submissions should propose appropriate compliance points for implementations.

- 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.

- Complete IDL definitions

  For reference purposes and to facilitate electronic usage, submissions should reproduce in one place a complete listing in compilable form of the IDL definitions proposed for standardization.

4.10 How to Submit

Submitters should send an electronic version of their submission to the *RFP Submissions Desk* (rfp@omg.org) at OMG by 5:00 PM U.S. Eastern Standard Time (22:00 GMT) on the day of the submission deadline. Acceptable formats are Postscript, ASCII, PDF, FrameMaker, Word, and WordPerfect. However, it should be noted that a successful submission must be supplied to OMG's technical editors in Framemaker source format, using the most recent available OMG submission template (document ab/97-06-02 at the time of writing). 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 also send, within three (3) working days after the submission deadline, a single hardcopy version of their submission 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 Mandatory Requirements

5.1.1 Proposals shall express interfaces in OMG IDL. Proposals should follow accepted OMG IDL and CORBA programming style. The correctness of the IDL shall be verified using at least one IDL compiler (and preferably more then one). In addition to IDL quoted in the text of the submission, all the IDL associated with the proposal shall be supplied to OMG in compiler-readable form.

5.1.2 Proposals shall specify *operation behaviour, sequencing*, and *side-effects* (if any).

5.1.3 Proposals shall be *precise* and *functionally complete*. There should be no implied or hidden interfaces, operations, or functions required to enable an implementation of the proposed specification.

5.1.4 Proposals shall clearly distinguish *mandatory* interfaces and other specification elements that all implementations must support from those that may be *optionally* supported.

5.1.5 Proposals shall *reuse* existing OMG specifications including CORBA, CORBAservices, and CORBAfacilities in preference to defining new interfaces to perform similar functions.

5.1.6 Proposals shall justify and fully specify any *changes or extensions* required to existing OMG specifications. This includes changes and extensions to CORBA inter-ORB protocols necessary to support interoperability. In general, OMG favours *upwards compatible* proposals that minimize changes and extensions to existing OMG specifications.

5.1.7 Proposals shall factor out functions that could be used in different contexts and specify their interfaces separately. Such *minimality* fosters re-use and avoids functional duplication.

5.1.8 Proposals shall use or depend on other interface specifications only where it is actually necessary. While re-use of existing interfaces to avoid duplication will be encouraged, proposals should avoid gratuitous use.

5.1.9 Proposals shall specify interfaces that are *compatible* and can be used with existing OMG specifications. Separate functions doing separate jobs should be capable of being used together where it makes sense for them 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 behaviour 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 / IEC 10746, Reference Model of Open Distributed Processing (ODP). Where such compatibility is not achieved, 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 service or facility 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 CORBAsecurity level and options are required to protect an implementation of the proposal? In answer to this question, a reasonably complete description of how the facilities provided by the level and options (e.g. authentication, audit, authorization, message protection etc.) are used to protect access to the sensitive objects introduced by the proposal shall be provided.
- What default policies should be applied to the security sensitive objects introduced by the proposal?
- Of what security considerations must the implementers of your proposal be aware?

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.

5.2 Evaluation criteria

Although the OMG adopts interface 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 ORB systems and software platforms will be considered.

5.2.3 Securability

The answer to questions in section 5.1.13 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 Standardised Metadata

Where proposals incorporate metadata specifications, usage of OMG standard XMI metadata representations will be considered, since this allows specifications to be easily interchanged between XMI compliant tools and applications. Since use of XML (including XMI, 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

Proposals are solicited for the definition of interfaces for a universal, AR/AP ledger which meets two top-level, conceptual requirements:

- **External integration** -- address the requirements and expectations for AR, AP and cash ledgers in an Internet environment, in which the transaction creation, management and settlement cycle is increasingly automated and interconnected with 3rd parties and intermediaries.

- **Internal integration** with other applications within the enterprise, for example, the FDTF applications http://www.omg.org/homepages/fdtf/index.htm

6.1.1 External integration

All individuals and businesses have external balances. These balances include accounts receivable from customers, accounts payable to suppliers and various financial liabilities and assets such as bank accounts and borrowings.

The human resources spent on administering, communication, billing, reconciliation, and settlement of interparty balances in western countries is certainly above 10 million person years per year. Commercial banking itself consists largely of mechanisms for correct and secure interparty balances. The lack of standardization in managing interparty balances also imposes logistical costs such as printing, postage, and driving to banks.

The entries within any external balance have common properties. These properties are universal and inherent. The universal attributes of an external transaction entry in the subject's books may include the following list.

1. identity of the party (e.g. customer or supplier)
2. amount of money,
3. date and time the transaction was concluded or executed,
4. description of what was exchanged (e.g. string, document, document reference or XML message.),

5. due date (expectations regarding date of settlement), and
6. settlement method (expectation regarding bank, settlement agent or method)

This RFP includes within its scope, support for common XML vocabulary for representing an AR/AP transaction, and transporting it among widely disparate systems.

6.1.2 Internal integration

For purposes of this RFP, an AR/AP system is defined as that basic view or information system for maintaining, managing, paying or collecting debts, or discovery and resolving differences in amount with respect to external parties, during or after the execution of a transaction.

Internal integration is within the software environment of the enterprise in which the efficiency of applications for selling, purchasing and other operations are not compromised by the fact that receivables collection, payables settlement and other balance sheet operations are performed centrally within a single AR/AP system. In a successful integration, users of those applications have complete and timely views of the state of payables and receivables settlement which are essential to operation. Conversely, the AR/AP system has complete and timely knowledge of the payables, receivables and other balance sheet actions executed by users on various operating applications.

AR and AP systems, historically, have interoperated very closely with software applications involved in selling, purchasing, cash management, and inventory. The imperative for near-real time integration has historically resulted in tightly bound and monolithic architectures. Introduction of changes, such as new selling or purchasing applications, or systems for B2B commerce, into these proprietary environments has been costly, difficult and error prone.

The lack of standardization in managing external party balances imposes costs beyond software or IT costs, to include rigidities in people's activities and roles, rigidities in organizational structure, inability to take advantage of new vertical and horizontal business solutions, and loss of access to markets both in sales and sourcing.

This RFP solicits proposals for an AR/AP foundation as forward and backward compatible as possible, and with the greatest possible prospects for incremental adoption alongside existing accounting systems, e.g. as a sub-ledger.

6.1.3 Shared Transactions

It is relevant that at the moment of execution of any transaction, there are two sovereign owners of the six items of data listed in 6.1.1 above. There are no major legal or cultural barriers preventing the sharing of views of these databy both parties within a single system, for example a hub or exchange or the system of one of the parties. This RFP solicits proposals which facilitate shared views of data. Such architecture may also enable parties to submit entries or adjustments to balances as drafts or offers to the other party, and distinguish such adjustments from original amounts and accepted adjustments

6.1.4 Resolution of business differences

It is also relevant that at the moment of consummating a transaction, the amounts and consideration are sometimes ambiguous. It is inherent in the operation of many markets that these invalid or open contracts are created and ultimately must be adjusted or canceled after the fact, within AR/AP systems. Proposals are solicited which provide least-common-denominator interfaces or usage models which facilitate the finding, correction and resolution of business differences between parties to transactions.

Note this requirement is in the business domain and can never be achieved purely by automation, reliable messaging and so forth. Differences in quantity, pricing, and qualities of the product or services are the cause of most differences between buyer and seller AP and AR. See below, “borders”.

6.1.5 Levels of aggregation

Proposals are solicited which provide solutions, either in automation or in usage models, for the problem between parties having mutual payables and receivables in systems which store them in different levels of aggregation. For example, some parties have historically maintained AR/AP records as Customer or Supplier accounts containing only Statement totals, or containing only Invoice totals, while maintaining large numbers of line items or details in sub-systems not accessible to the AR/AP system. As a result, automation of reconciliation with these companies at the detail level is a problem. Numerous side effects arise in these situations such as credit/debit memos at inappropriate levels of aggregation.

Solutions are solicited which apprehend these problems in aggregation, and apprehend the best existing applications and practices in AR/AP that prevent these legacy parties from wrecking the rest of the world’s AR/AP processes. Submitters shall ensure their AR/AP solution provides the minimum necessary support for applications and practices addressing aggregation differences.

6.1.6 Small and Medium Business (SMB) enablement

No AR/AP facility can hope to accomplish widespread auto-reconciliation of inter-party balances unless it can talk to small businesses. SMBs are the source and/or destination of the vast majority of transactions in the economy. This RFP solicits responses that are economically feasible for small businesses.

Figure 1 describes the relationship of a system providing AR/AP services to other software systems in the enterprise. The labeled arrows in Figure 1 identify nominal flows of information into and out of the AR/AP system.

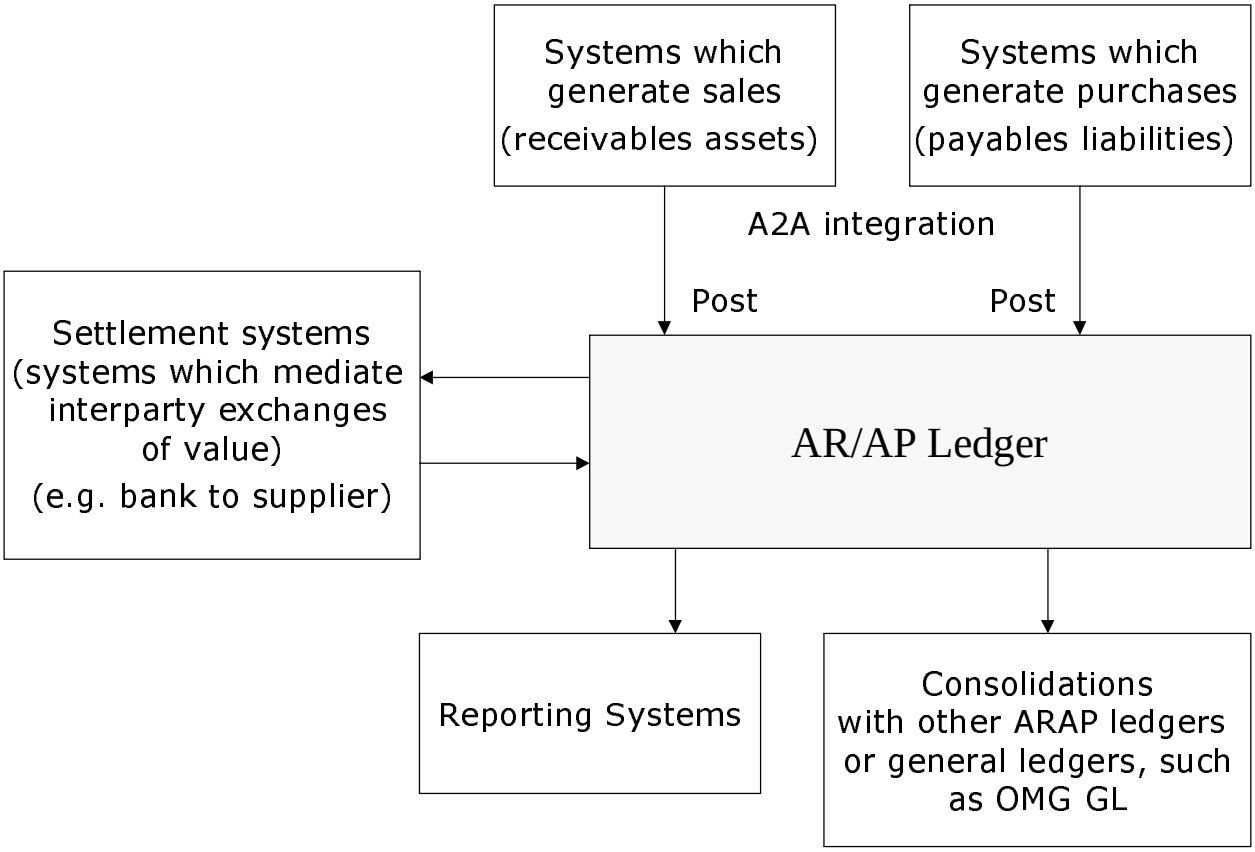

Figure 1: Overview of AR/AP System Interfaces

The terms below define Figure 1. These definitions are intended only to aid in the understanding of the services requested by this RFP. Submitters are free to alter these definitions as needed to clarify the intent of their submissions.

A Sales System is any device or system used by the business entity to record a sale of services or products, or which results in revenue or receivable assets in any form. It includes systems which result in cash, credit card receivables or any form of monetary obligation including foreign currencies, micropayments, digital cash, or other monetary assets.

Sales systems may include any form of internet Business Service Provider (BSP), web storefront host, billing system, or exchange which concludes sales transactions or generates receivable assets in the course of selling any real and non-financial thing on behalf of the business entity

A Purchasing System may be any device or system used by the entity to record a purchase of any asset, service or product, or which results in any type of expense or external payable in any form. It includes systems which result in transfers or remittances of cash, credit card obligations or any liability or outbound transfer of value in micropayments, digital cash, or other medium, in the course of purchasing real and nonfinancial things.

Purchasing systems include any form of supply chain interaction, internet Business Service Provider (BSP), purchasing portal, or exchange which commit the company in any quantifiable financial liability, in the course of purchasing something.

An AR/AP Ledger is that system which records and maintains those discrete amounts by which the entity's mutual balances with external parties changes during the course of business, i.e. as transactions are executed.

An AR/AP Ledger does not include within its scope, behaviors or interfaces that are in the nature of a Sales System or Purchasing System.

A settlement system is any payments system, cash receiving system, settlement system, book entry system, treasury or intercompany system or application that reassigns one asset or liability for another (other than contexts of buying or selling anything real.) In other words, a settlement system performs balance sheet transfers, and the other systems impact the income statement. These distinctions are not crucially important in the design of AR/AP but are provided to explain some common classes of applications. See Mandatory Requirements, below

A General Ledger is an instance of OMG's GL facility which is either a subledger or the entity's master general ledger. The GL is the primary information system for financial, statutory and tax reporting, and fiscal accountability and control.

The purpose of this RFP is to provide standards for interfaces that support the nominal information flows into and out of the AR/AP system from any and all the above applications.

6.1.7 Master GL

Small and medium businesses often use a single, integrated software product for the following requirements, rather than multiple products or systems, for these purposes:

1. Financial reporting under generally accepted accounting principles (GAAP),
2. Tax reporting (income, sales, VAT etc.),
3. Cash balance, retrospective and forecasted cash flow reporting,
4. General fiscal control and internal control, and
5. AR collection and AP payment.

These requirements become problematic to achieve whenever the SMB has any business system outside of their monolithic accounting package. As a result, most businesses stay within the functionality of their chosen package, and vertical business applications are generally provided by all accounting system vendors in very similar ways. This requirement for integration now impedes any incremental adoption of internet-based sales, purchasing, and settlement systems.

The problem is the lack of a standard GL and AR/AP model, and a lack of a consistent boundary between the core (GL-AR/AP), and the selling and purchasing systems.

6.2 Specification style

6.2.1 Applying ISO RM/ODP viewpoints

The experiences from the OMG General Ledger facility has shown that it is useful to specify more than the required computational viewpoint (OMG IDL) from the ISO/IEC 10746, Reference Model of Open Distributed Processing (ODP), but also to provide an informative enterprise viewpoint (finance/99-02-01) and information viewpoint. (finance/99-02-02) Proposals are encouraged to provide UML models describing the AR/AP facility from the RM/ODP enterprise and information viewpoints.

6.3 Scope of Proposals Sought

This RFP seeks responses that identify the external interfaces, relationships and semantics, that are required for accounting and business application interoperability with AR/AP systems.

The key concepts of an AR/AP Ledger are defined as follows:

- AR/AP Ledger – A superset of the OMG General Ledger including all of its interfaces, but having further extensions necessary to provide a permanent repository of transactions executed with respect to external parties, and to achieve the other goals in section 6.1.7

- Transaction – (see GL facility, p. 16, transaction information) - a balanced set of two or more entries (debits and credits) to a general ledger or AR/AP ledger.

- AR/AP entry – a discrete amount, together with its associated reciprocal party identifier, transaction date, description, expected settlement date and method, and XBRL type or account code.

- Posting – The act of committing an individual transaction consisting of a balanced set of two or more entries (debits and credits) to a general ledger or AR/AP ledger.

- Account – An attribute of a transaction entry (row), which classifies that entry with any valid value in the Chart of Accounts list. The values in the chart of accounts may be statutory classifications for tax or financial reporting, but are usually short or mnemonic values which support additional purposes in workflow, transaction validation, reporting, etc.

- XBRL type – A statutory GAAP classification established by regulatory agencies; which in the US, is a value from the XBRL taxonomy for Commercial and Industrial companies.

This RFP does not seek proposals for other financial and accounting applications such as:

- General Ledger,
- Purchasing,
- Invoicing,

- *and other similar applications.*

However, proposals must define how other applications (such as those mentioned previously) could interface and interoperate with the AR/AP Facility.

This scope of this RFP is limited exclusively to the AR/AP component of the Roadmap of OMG's Financial Domain Task Force. (finance 98-12-07) The "AR/AP system" identified in 6.1 is properly a "AR/AP services provider". That is, this RFP solicits interfaces to any system that provides those services, regardless of what it is called and what other services it may provide.

The scope of proposals shall cover, but are not limited to the following:

- The interfaces required to support interoperability of AR/AP applications with independently developed GL, sales/purchasing, and AR/AP systems.
- How to create, read, update and delete transactions and entries in the AR/AP ledger.

This RFP solicits interface proposals to support the following information flows identified in Figure 1:

- Post transaction – requests to the AR/AP service to store a new external balance entry, i.e. asset or liability, together with its associated credits and debits forming a balanced entry.
- Update result codes (negotiation state) – the order creation, fulfillment and settlement transactions within a commercial transaction pattern (business process) are usually separated in time. The atomic transactions themselves are also inherently asynchronous since they involve third parties. This RFP invites proposals that update result codes on transactions as well as groups of transactions, when delivery and/or business acceptance becomes known from third parties to transactions after the original posting.
- Report – return 0 or more transactions or entries (rows) meeting various criteria, to include summary and detail reports by party, by account, by date range, by status (outstanding or not outstanding), and by settlement method and due date, in addition to the existing functional interfaces provided in the General Ledger facility upon which this RFP is derived.

For this RFP, the interfaces shall be specified with the expectation that the AR/AP system is the "server", and some other system is the client. That is:

- Where information is fed into the AR/AP system, the model to be supported is "push" — the client system initiates the transfer; and

- Where information is obtained from the AR/AP system, the model to be supported is “pull” — the AR/AP system is the server and it responds to requests for that information.

Submissions may address other cooperative flow models as well. For example, an emerging pattern of ecommerce is an unposted transaction batch. The AR/AP ledger may be used as a generalized inbox for purchase orders and sales orders arriving from untrusted sources, similar to postal mail. The Small /Medium Business might accept delivery of incoming purchases and sales into AR/AP in an unposted status pending manual approval.

6.4 Relationship to Existing OMG Specifications

The AR/AP Facility may (at the submitter’s option) reuse or depend upon the following existing OMG technologies. Submitters shall discuss relationships to these OMG specifications in their submissions.

- General Ledger Facility
- Currency Facility
- Event Service
- Security Service
- Transaction Service
-
- Notification
- Party Management Facility
-
-

6.5 Related Documents and Standards

- OMG’s Organization Structure Facility RFP and submissions
- ebXML, the Electronic Business XML of OASIS and UN/CEFACT
- XBRL, the Extensible Business Reporting Language
- Financial Domain Task Force Roadmap http://www.omg.org/homepages/fdtf/finance_roadmap.htm
- UDDI (Uniform Discovery, Description and Integration initiative) http://uddi.org/
- XML Schema (W3C)
- XML Namespaces
- Uniform Resource Names (URNs) http://www.ietf.org/html.charters/urn-charter.html
- Uniform Resource Identifiers (URIs) IETF rfc 2396
- International Accounting Standards Committee (IASC) standards
- Generally Accepted Accounting Principles (GAAP)
- Common Facilities RFI #2 (Financial Services) Responses
- Reference Model for Open Distributed Processing (RM-ODP)

-
- OAGIS integration specification of the Open Application Group Inc. (OAGI)

6.6 Mandatory Requirements

6.6.1 Proposals shall provide a sufficient level of description of interfaces and behaviors to allow for independently developed accounting applications (including legacy) to interoperate using submitted AR/AP interfaces.

6.6.2 Proposals shall provide views of the balances and details of AR/AP transactions as they existed at any specific point in time.

6.6.3 Submissions shall incorporate classic double entry accounting (CDEA) as the basic semantics of representing transactions. CDEA is the system of recording transactions in two or more offsetting debits and credits, which add up to zero, with each row having date/time and account classifications necessary for statutory GAAP and tax reporting (generally accepted accounting principles).

6.6.4 Submissions shall support interfaces that enable roll-up. For purposes of this requirement, roll-up is defined as the summarizing of multiple rows of AR/AP into aggregates along at least two dimensions (i.e. group-by queries). These dimensions will include summaries by party ranges (customer or supplier), by date ranges, and by party ranges by date ranges as a minimum.

6.6.5 Settlement – Submissions shall support a rich and complete manifest (remittance advice) at the time of executing settlements. In other words, the core AR/AP system must contain details, or references to details, of products and services associated with the AR or AP with the complete granularity that reasonably exists in the business domain, and be capable of providing completely granular information to the AR/AP user, and manifest accompanying a payment or settlement when necessary.

6.6.6 Submissions shall be a logical superset of OMG's General Ledger facility, or provide explanation why OMG's GL facility was not used. Any submissions not based on OMG's GL facility shall explain how the five purposes of a master GL (Financial reporting, Tax reporting, Cash balance/cash flow management, Fiscal control/internal control, and administering settlement of AR/AP. (6.1.7 above) are achieved by the submission.

6.6.7 Submissions shall support a system of coding and classification of transactions sufficient to enable financial reporting under Generally Accepted Accounting Principles (GAAP), for example mapping

transactions or account Ids in the chart of accounts, to XBRL classifications

6.6.8 Interfaces shall be specified with the expectation that the AR/AP system is the "server", and some other system is the client. That is:

6.6.8.1 Where information is fed into the AR/AP system, the model to be supported is "push" — the client system initiates the transfer; and

6.6.8.2 Where information is obtained from the AR/AP system, the model to be supported is "pull" — the AR/AP system is the server and it responds to requests for that information.

6.6.9 Submissions shall support party roles, identifiers or structures which unambiguously support the distinction between AR and AP items for the same party not having right of offset (netting), but which are not bound to particular roles (or names of roles) such as Customer or Supplier..

6.7 Optional Requirements

The Model-Driven Architecture (MDA) approach under discussion in OMG will be able to support platform independent models that can be mapped onto various platform specific models. This RFP is issued before a new RFP-template with a revised section 5 for General Requirements following a MDA approach has been developed. The mandatory requirements for this RFP are therefore based on the existing RFP-template. Submitters are, however, encouraged to follow a MDA (Model Driven Architecture) approach. This will make it easier to create a future MDA-conformant version of the AR/AP facility, after a formal OMG establishment of the MDA-approach with a corresponding RFP template. It may also result in valuable input to the process of establishing MDA.

6.7.1 Proposals may follow a model driven architecture and provide

- a platform-independent UML model of the facility (PIM),
- a platform-specific model (PSM) based on the UML profile for CORBA, and
- platform-specific models (PSM) for other technologies. Of particular relevance is the technology model of ebXML (i.e. the exchange of business documents derived from registry of core components using SOAP messaging), and a mapping to XML business documents using XMI

6.7.2 Proposals may provide UML models describing the AR/AP facility from the RM/ODP enterprise and information viewpoints described in ISO/IEC 10746, Reference Model of Open Distributed Processing

6.7.3 Proposals may provide for consolidated reporting from multiple AR/AP

ledgers. Even though consolidation is not required by the majority of AR/AP users, it is sometimes performed in multi-company enterprises (often by manual procedures due to lack of systems integration).

6.7.4 Proposals may provide for the passing of individual transactions or batches of transactions across frontiers to/from third parties or settlement agents, banks, etc. as a message format for B2B commerce.

6.7.5 Proposals may provide for interparty transmission of AR/AP ledger rows for consolidation or roll-up into *reciprocal party* books. Such proposals may define the rules for switching of the subject/object context of the consolidated rows. For example, debits may become credits, originating and reciprocal party fields may be reversed, and account codes may be reversed under unambiguous rules.

6.7.6 Proposals may provide for localization of the AR/AP ledger with respect to statutory requirements, natural languages, and local accounting practices.

6.7.7 Proposals may provide interfaces to support the representation of customized AR/AP processing rules which may include GL rules, disbursement rules, transfer payee rules, reporting rules, costing/labor distribution rules, gross-up rules, custom calculation formulas, and retro pay rules. Proposals may also consider this internal to the AR/AP process and not a necessary external interface.

6.7.8 Proposals may provide interfaces to support the input of tax rules to the AR/AP facility. Proposals may also consider this internal to the AR/AP process and not a necessary external interface.

6.7.9 Proposals may provide interfaces to support the “real-time” AR/AP-processing model where all AR/AP calculations are made continuously based on the availability of data.

6.7.10 Submissions may provide solutions for associating the related transactions of business collaborations, as defined in the ebXML Business Process workgroup

6.7.11 Submissions may provide models which support multiple namespaces or agencies' party ID lists, e.g. DUNS numbers, industry syntax such as telephone billing numbers, etc. Submissions may support frameworks such as UDDI whitepages, ebXML addressing, or W3C namespaces or URNs as solutions for global Party Id schemes

6.7.12 Reciprocal party views – A reciprocal party is any party with respect to whom the AR/AP ledger maintains a balance (e.g. trading partners) .

Submissions may provide interfaces which enable reciprocal parties to view their balances and entries in the AR/AP ledger, without compromising the privacy of transactions they are not a party to.

6.8 Issues to be discussed

6.8.1 Submissions shall discuss support for other standard general ledger models or vocabularies, or explain why the data elements or interfaces in those models are not supported. The existence of a particular data element in more than one of the other GL models creates some presumption that that element is widely required in a GL. “Other GL models” include, EDIFACT structures for general ledger, and OAGIS PostJournal BOD. In addition, the submission shall discuss support any general ledger structure or spec that may emerge from XBRL or ebXML Core Components prior to the submission.

6.8.2 Accounts payable and receivable transactions are based on commercial and legal models that are very widely understood. The EWG of ASC X12 and UN/CEFACT is the agency responsible for maintaining definitions of most data elements in accounts payable and receivable. At date of this RFP, this responsibility had been delegated to the Core Components workgroup of the ebXML. Submissions shall document the relationship to these models.

6.8.3 Security and integration with the OMG Security Service, and the requirement for additional security services, models or profiles.

6.8.4 Time and time zones.

6.8.5 Considerations for integration of legacy systems implementing AR/AP interfaces. This includes interoperability with compliant (OMG) and non-compliant (wrapped) systems.

6.8.6 Relationships and dependencies with respect to other OMG or non-OMG technologies.

6.8.7 Submissions shall state whether any accounting period "close" operation is implemented. Submitters shall discuss how the mechanism operates

6.8.8 Submissions shall state whether any data cleardown / purge operations are supported. Submitters shall discuss how the mechanism operates.

6.8.9 Proposals shall discuss in detail the semantics for any use of XML and its relationship to the CORBA standards in this specification.

6.8.10 Submitters shall discuss relationships to the OMG specifications in their submissions, as described in section 6.4.

6.8.11 The exchange of transactions with third parties normally takes place within within a business process framework such as Rosettanet PIPs, ebXML business process schemas, or TMWG UMM. Submissions shall describe their relationship to such frameworks.

6.8.12 Submitters shall discuss mechanisms provided in the submission to enable the AR/AP system or its users to administer payables and receivables with external parties when the third party AR/AP system maintains items and balances at varying levels of aggregation described in 6.1.5

6.9 Evaluation Criteria

The contents of this RFP establish the criteria for evaluation of AR/AP Facility submissions. Submissions will be evaluated by the AR/AP Evaluation Team of the OMG's Financial Domain Task Force (FDTF). The Evaluation Team will consist of a small group of interested OMG member organizations. The evaluation will be based on the stated mandatory and optional requirements, as well as, the other stated and referenced requirements of this RFP.

6.10 Other information unique to this RFP

Submitters shall include all information related to their submission that may not have been called for in the requirements of this RFP but are important in understanding or implementing the specification.

6.11 RFP Timetable

The timetable for this RFP is given below. Note that the TF 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 in the Member Services section of OMG's Web page (URL http://www.omg.org/)

Approx Day	Event or Activity	Actual Date
	Preparation of RFP by TF	*February 1, 2001*
	Approval of RFP by Architecture Board *Review by TC ("Three week rule")*	*February 25, 2001*
0	*TC votes to issue RFP*	*April 25,2001*
60	*LOI to submit to RFP due*	*August 20,2001*
120	*Initial submissions due*	*August 20,2001*
134	*Voter registration closes*	
141	*Initial submission presentations*	*September 10, 2001*
	Preliminary evaluation by TF	*November 12, 2001*
240	*Revised submissions due*	*December 24, 2001*
261	*Revised submission presentations*	*January 14 , 2002*
	Final evaluation and selection by TF *Recommendation to AB and TC*	*April 15, 2002*
	Approval by Architecture Board *Review by TC ("Three week rule")*	*April 18, 2002*
330	*TC votes to recommend specifications*	*April 19, 2002*
360	*BOD votes to adopt specifications*	*June 4, 2002*