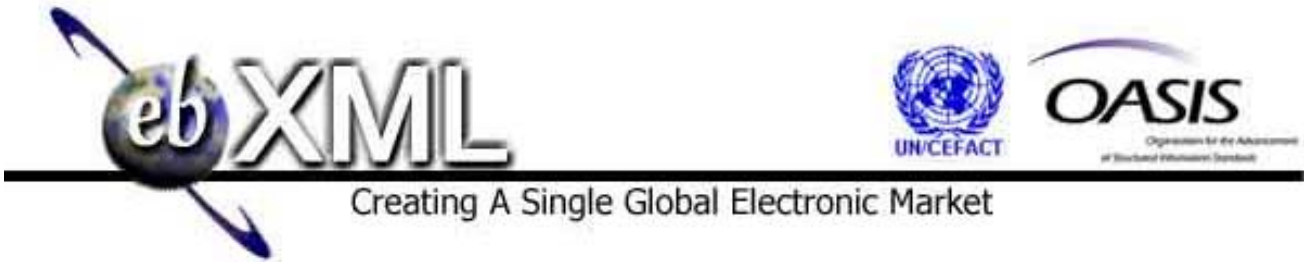

Requirements Specification

v1.06

Requirements Team

May 11, 2001

(This document is the non-normative version formatted for printing, July 2001)

Table of Contents

1 Status of this Document

This document specifies an ebXML Technical Specification for the eBusiness community.

Distribution of this document is unlimited.

The document formatting is based on the Internet Society's Standard RFC format.

This version:

www.ebxml.org/specs/ebREQ.pdf

Latest version:

www.ebxml.org/specs/ebREQ.pdf

2 ebXML Participants

We would like to recognize the following for their significant participation to the development of this document.

Mike Rawlins	Rawlins EC Consulting - Team Leader
Mark Crawford	Logistics Management Institute - Team Editor
Don Rudie	Dun & Bradstreet
Thomas Warner	The Boeing Company
Kenji Itoh	Japan Association for Simplification of International Trade Procedures
Jean Kubler	UN/Economic Commission for Europe
Kathleen Tyson-Quah	KTQ Consulting Limited
David R.R. Webber	XML Global
Garrett Minakawa	Oracle Corporation
Turochas Fuad	Sun Microsystems Incorporated
Dr. Marcia McLure	McLure-Moynihan Inc.
Norbert Mikula	Data Channel
Christopher Lueder	Mitre Corporation
Scott Hinkelman	International Business Machines
Ravi Kackar	Kraft Foods
Doug Hopeman	XML Solutions
Gaile L. Spadin	Data Interchange Standards Association
Sangwon Lim	Korea Institute for Electronic Commerce

Additionally, valuable input was provided from the Team Leaders and various members of the other ebXML Project Teams.

3 Document Introduction

3.1 Summary of contents of document

This *ebXML Requirements Specification* represents the work of the ebXML *Requirements Project Team*. It defines ebXML and the ebXML effort, articulates business requirements for ebXML, and defines specific requirements that SHALL be addressed by the various ebXML project teams in preparing their deliverables.

The keywords MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD, SHOULD NOT, RECOMMENDED, MAY, and OPTIONAL, when they appear in this document, are to be interpreted as described in Internet Engineering Task Force (IETF) Request For Comments (RFC) 2119.

3.2 Audience

The target audiences for this document are:

- ebXML Project Teams, as a foundation for developing their technical specifications
- Other interested parties, as a means to convey the purpose, scope, and vision of ebXML

3.3 Related documents

ebXML Invitation

http://www.ebXML.org/documents/199909/ebXML_invitation.htm

ebXML Terms of Reference (TOR)

http://www.ebXML.org/documents/199909/terms_of_reference.htm

Recommendations for ebXML Kickoff Meeting - UN/CEFACT/TMWG/N104

http://www.ebxml.org/documents/contributions/tm104.pdf

Technical Reports and Publications, World Wide Web Consortium, http://www.w3.org/TR

3.4 Documentation conventions

The following highlighting is used for non-normative commentary in this document:

Note General comments directed to all readers.

4 General Introduction

Electronic Business Extensible Markup Language (ebXML) is an international initiative established by the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) and the Organization for the Advancement of Structured Information Standards (OASIS) with a mandate to undertake a 15-18 month program of work. As identified in the ebXML Terms of Reference, the purpose of the ebXML initiative is to research and identify the technical basis upon which the global implementation of XML can be standardized. The goal is to provide an XML-based open technical framework to enable XML to be utilized in a consistent and uniform manner for the exchange of electronic business (eb) data in application to application, application to human, and human to application environments—thus *creating a single global electronic market.*™ [1]

ebXML is based on international standards and is itself intended to become an international standard. A key aspect for the success of the ebXML initiative is adherence to the use of the W3C suite of XML and related Web technical specifications to the maximum extent practical. Although these specifications may not provide the optimal technical solution, acceptance of ebXML by the business community and technical community is tied to XML. However, certain key elements of the ebXML technical framework may require adopting alternative technologies and technical specifications—such as those of the Internet Engineering Task Force (IETF), International Organization for Standardization (ISO), Institute of Electrical and Electronics Engineers (IEEE), International Electrotechnical Commission (IEC), UN/CEFACT, OASIS, and the Object Management Group (OMG).

Note ebXML operates under the procedures identified in the ebXML Terms of Reference.

4.1 ebXML vision and scope

4.1.1 ebXML vision

The ebXML vision is to deliver:

> *"A single set of internationally agreed upon technical specifications that consist of common XML semantics and related document structures to facilitate global trade."*

[1] "creating a single global electronic market" is a trademark of the ebXML Working Group
Key words for use in RFCs to Indicate Requirement Levels - Internet Engineering Task Force, Request For Comments 2119, March 1997 http://www.ietf.org/rfc/rfc2119.txt?number=2119

These ebXML technical specifications are intended to create a *Single Global Electronic Market.*™ To create this single global electronic market, this single set of ebXML technical specifications:

- SHALL be fully compliant with W3C XML technical specifications holding a recommended status[2]
- SHALL provide for interoperability within and between ebXML compliant trading partner applications
- SHALL maximize interoperability and efficiency while providing a transition path from accredited electronic data interchange (EDI) standards and developing XML business standards
- SHALL be submitted to an appropriate internationally recognized accredited standards body for publication as an international standard

4.1.2 ebXML scope

The ebXML initiative is targeted at every sector of the business community, from international conglomerate to small and medium sized enterprises engaged in business-to-business and business-to-consumer trade. With that audience in mind, the ebXML initiative is committed to developing and delivering specifications that will be used by all trading partners interested in maximizing XML interoperability within and across trading partner communities.

4.2 ebXML requirements specification purpose and scope

The *ebXML Requirements Specification* purpose and scope are defined in the following sub-sections.

4.2.1 ebXML requirements specification purpose

This *Requirements Specification* has two primary purposes. The first of these is to provide clearly articulated requirements from representatives of international business and accredited standards organizations. These requirements are intended to serve as a foundation for all other ebXML specifications and SHOULD assist the ebXML project team members in developing their deliverables in a consistent manner. This specification is also intended to convey to interested parties the purpose, scope, and vision of ebXML.

[2] Technical Reports and Publications, World Wide Web Consortium http://www.w3.org/TR

4.2.2 ebXML requirements specification scope

This *ebXML Requirements Specification* applies to the work underway within the current ebXML project teams. Each project team has provided input to this document to ensure consensus with its contents. In addition to the *Requirements Project Team*, project teams currently chartered by the ebXML Steering Committee are:

- Business Process
- Technical Architecture
- Core Components
- Transport/Routing and Packaging
- Registry and Repository
- Trading Partner
- Proof of Concept

In addition, the following special management support teams are chartered by the ebXML Executive Committee:

- Quality Review
- Marketing Awareness

4.3 General ebXML Principles

General ebXML principles to be followed in developing ebXML deliverables are to create technical specifications that:

- Enable simple, easy and ubiquitous electronic business through the use of XML
- Use W3C XML technical specifications holding recommended status to the maximum extent practicable
- Provide a global cross-industry open, interoperable standard for business-to-business and business-to-consumer trade
- Coalesce the structure and content components of divergent XML initiatives into a single useable XML business standard

- Provide impetus so that common resources currently engaged in short-term vertical solutions SHALL be marshaled to reach a common long-term, horizontal solution
- Support vertical and horizontal segments of industry and business participants
- Avoid proprietary solutions that impose financial or software requirements constraints on ebXML users to buy, install or programmatically support any ebXML unique software products in the conduct of business information exchange
- Strive to minimize costs of doing business electronically
- Provide multi-lingual support
- Accommodate national and international trade requirements
- Provide a migration path from accredited EDI and developing XML business standards
- Apply when possible the simplification principles of SIMAC Business Requirements[3]

[3] *SIMAC Future Vision Statement* - UN/CEFACT Ad Hoc Working Group on Simple-EDI and Forms and Web Based EDI (SIMAC) - UN/CEFACT, TRADE/CEFACT/1999/CRP.12 http://www.unece.org/trade/untdid/download/99cp12.pdf

5 Business Requirements

This section describes the business requirements for business to be conducted electronically. The business requirements identified in this section are oriented toward using XML for electronic business, but most of the requirements are applicable to implementation with other technologies as well.

The scope of the ebXML business requirements is to meet the needs for the business side of both business-to-business (B2B) and business-to-consumer (B2C) activities. Consumer requirements of the B2C model are beyond the scope of the ebXML technical specifications. Application-to-application (A2A) exchanges within an enterprise may also be able to use the ebXML technical specifications, however ebXML A2A solutions SHALL not be developed at the expense of simplified B2B and B2C solutions.

Note For ease of reading, the term business is to be interpreted as interchangeable with for-profit, non-profit, not-for profit, and government entities.

Note For the purposes of this document, Application-to-Application is defined as the computer-to-computer exchange of business information without human intervention both within and across enterprise boundaries.

The business requirements to be addressed by the ebXML initiative are divided into nine core areas - General Business, Electronic Business, Globalization, Openness, Usability/Interoperability, Security, Legal, Digital Signatures, and Organizational. Each of these requirements is identified in the following sections.

5.1 General business requirements

Business has a real need to use new technology with minimized investment to gain competitive advantage. The advent of the Internet and World Wide Web has proven to offer such benefits. However, realizing these benefits requires a functionally neutral standard method of exchanging data. Specifically, business needs a solution that provides:

- A single, consistent, simple approach to using XML for electronic business processes in both the B2B and B2C environments
- A process and recommendation for ebXML conformance
- Support for both vertical (e.g. industry, functional, organizational) and horizontal (e.g. cross-industry, multi-functional, organizationally neutral) solutions regardless of the sophistication of the user

- Support for a range of implementations from basic, low cost solutions appropriate for Small and Medium Enterprise (SME) deployment, to comprehensive, complex implementations using all optional features appropriate to large enterprises
- A range of usage from using core features in ad hoc, informal exchanges to highly formal, structured exchanges
- A single consistent modeling language and methodology
- Support for current business models and practices as well as new ones developed through business process modeling
- A business process metamodel that supports individually developed business process models
- Design rules for developing ebXML compliant XML documents that are based on approved W3C schema specifications
- Syntactically neutral core components
- XML syntax based boilerplate schemas and tags to support individual trading partner business processes that -
    - eliminate duplication of effort
    - provide support for XML metadata
    - clearly identify core, mandatory features, and optional features
    - provide a mechanism for full specification of semantic meaning
- Fully interoperable transport, routing, and packaging solutions
- Security solutions that meet business confidentiality requirements
- A single recognized international standards organization to oversee continued ebXML work
- An open development process with no barriers to entry
- Open, readily accessible, perpetually free technical specifications and standards
- A solution that minimizes costs for development, maintenance, and use

Note Business looks to XML as a means of gaining competitive advantage through leveraging new technology. Minimizing the cost of doing business electronically is a key element in achieving a competitive advantage. The cost of doing business electronically can be grouped into acquisition, development, deployment and customization, integration with

business applications, and operations and support. It is expected that using XML for electronic business will be less costly than traditional forms of EDI and other existing electronic commerce technologies in each of these areas. This expected cost reduction is a driving force for considering XML over traditional EDI technologies.

5.2 Conducting electronic business using ebXML

Business applications need to be able to exchange structured business documents (encoded in XML) with a corresponding application of another enterprise to support a business process. This exchange may either be completely without human intervention, as is the case with traditional EDI, or with some level of human intervention to correct missing or erroneous data. Business applications may also need to exchange structured business documents with intermediaries such as portals and brokers. Because a majority of businesses do not have sophisticated IT architectures, business applications will need to exchange structured business documents with trading partners who will be limited to viewing and manually processing both inbound and outbound transactions. Business applications also require information exchange mechanisms that provide for the exchange of pure XML payloads but may also support plug-and-play, shrink-wrapped, syntactically-neutral solutions.

Additionally, business applications may also need to:

- Be able to generate business documents encoded in XML and other syntax structures that can be used in traditional computer to computer exchanges as well as being displayed using an associated style sheet keyed to a specific presentation format; such as the appropriate U.N. Layout Key for Trade Documents or a trading partner specified format.[4]

- Enable data entry of business documents using a specified presentation format; such as the appropriate U.N. Layout Key for Trade Documents or a trading partner specified format. The data entry SHALL result in an ebXML compliant encoded document representing the business information.

5.3 Globalization

Global solutions are critical in today's ever expanding marketplace. The underlying purpose of ebXML is to facilitate international trade. To achieve "*a single global electronic market*" that such facilitation implies, it is critical to simplify existing exchange standards methodologies and harmonize divergent approaches. This simplification and harmonization can be achieved through developing a business metamodel in conjunction with syntax neutral core components. Both of these deliverables SHALL accommodate divergent national and multi-national process

[4] *United Nations Layout Key for Trade Documents, Recommendation No. 1, second edition,* adopted by the Working Party on Facilitation of International Trade Procedures, Geneva, UN/ECE, ECE/TRADE/137, March 1981 http://www.unece.org/cefact/rec/rec01en.htm

requirements, and SHOULD support backward compatibility with the developing ebXML technical framework.

To simplify development efforts, all work SHALL use English. To support globalization, all ebXML technical specifications SHALL be translatable into other natural languages. Translation into other natural languages is the responsibility of the intended user, although such translations SHOULD be supported in the ebXML repository. Regardless of language, and in keeping with the requirements of W3C XML 1.0, all work SHALL be compliant with Unicode and ISO/IEC 10646 for characters, IETF RFC 1766 for language identification tags, ISO 639 for language name codes, and ISO 3166 for country name codes.[5] [6] [7] [8] [9] [10] [11] [12]

5.3.1 Openness

Openness is a critical aspect of ebXML. Business requires the ability to easily access ebXML technical specifications without regard to "membership", or payment of access and/or use fees. ebXML technical specifications SHALL be completely open to all potential users so as to eliminate the barriers for entry. Openness requires several key components to ensure viability. Chief among these is an open, easily accessible registry and repository for the ebXML technical specifications.

5.3.2 Registry and repository

A registry is required to allow process owners to submit, classify, register and update mapping templates, business process specifications, and data interchange specifications. This registry MUST have an interface that supports access by humans as well as computer applications. This registry MUST support an agreed upon security protocol.

A repository is required for storage and retrieval of various items that support performing business electronically. There are two distinct sets of business requirements on the repository: a set dealing with managing the workflow of developing standard components that are stored in the repository, and a set dealing with application usage of the repository. Additionally, the

---

[5] *Extensible Markup Language (XML) 1.0, (Second Edition)*, World Wide Web Consortium, October 2000 http://www.w3.org/TR/REC-xml

[6] *Information technology -- Universal Multiple-Octet Coded Character Set (UCS) -- Part 1: Architecture and Basic Multilingual Plane*, International Organization for Standardization, ISO 10646-1:1993(E), 1993 http://www.iso.ch

[7] *Tags for the Identification of Languages*, Internet Engineering Task Force, Request For Comments 1766, March 1995 http://www.ietf.org/rfc/rfc1766.txt

[8] *Code for the Representation of Names of Languages*, 1st Edition, International Standardization Organization, ISO 639-1, 1988 http://www.iso.ch

[9] *Codes for the Representation of Names of Languages: Alpha-3*. 1st Edition. Geneva: International Standardization Organization, ISO 639-2, 1998 http://www.iso.ch

[10] *Country codes,* International Standardization Organization, ISO 3166-1,1997http://www.iso.ch

[11] *Country Subdivision Code*, International Standardization Organization, ISO 3166-2, December 1998 http://www.iso.ch

[12] *Code for formerly used names of countries, International Standardization Organization,* International Standardization Organization, ISO 3166-3, March 1999 http://www.iso.ch

repository MUST support the information needs of the ebXML work group and project teams, as well as ebXML technical specification users with respect to glossaries and products.

Note A registry is a mechanism whereby relevant documents and metadata about them can be registered such that a pointer to their location, and all their metadata, can be retrieved as the result of a query. A repository is a location or a set of distributed locations where documents pointed at by the registry reside and from which they can be retrieved by conventional (http / ftp) means, perhaps with additional authentication/permission layers.

The ebXML Registry and Repository SHALL support the concept of a network of registries and repositories that can intercommunicate via the interfaces specified by the ebXML *Registry and Repository Project Team*. A registry can be established by an industry group or standards organization and can intercommunicate with any number of repositories. In addition, content with a repository can reference content within another repository. The concept of a single repository is not scalable, nor does it promote the idea of a global web.

If ebXML is to exist beyond its initial 18-month timeframe, then ebXML SHOULD maintain responsibility for ebXML technical specifications, ebXML work group deliverables, and ebXML glossaries in an ebXML-supported repository. However, if the decision is made that ebXML will not exist after the initial set of deliverables, or that ebXML will not maintain or support its own repository, then ebXML MUST determine if repository oversight responsibilities for ebXML technical specifications SHOULD transition to UN/CEFACT, OASIS, or some other existing XML business standards organization or consortium.

5.4 Usability/interoperability

Usability and interoperability of the ebXML technical framework are critical business requirements. Components of usability and interoperability are architecture; transport, routing, and packaging; extensibility; and leveraging existing technology. Each of these is addressed in the following sub-sections.

5.4.1 Architecture

This is a primary requirement of the ebXML initiative. To maximize interoperability, the ebXML architecture SHOULD support

- Common Business Processes - Both entities involved in the exchange of data MUST be engaged in executing the same transaction in the context of a business process
- Common Semantics - Common meaning, as distinct from words, expression, or presentation
- Common Vocabulary - A direct correspondence between words and meaning
- Common Character Encoding

Note UNICODE, which is specified in the W3C XML Version 1.0 technical specification, provides this.

- Common Expression - Common set of XML element names, attributes and common usage of those attributes, common approach to document structure
- Common Security Implementations
- Common Data Transfer Protocol
- Common Network Layer

Note As with other non-functional requirements, some aspects of achieving interoperability may conflict with other non-functional requirements. Where a requirement is not met, software can usually be developed to provide a bridge. However, such bridges may increase costs of development, implementation, or both, and conflict with cost minimization. In other cases, achieving interoperability enhances other requirements. For example, maximizing interoperability helps to achieve platform independence.

5.4.2 Transport, routing and packaging

Any exchange of business information requires fully described transport, routing, and packaging methodologies. These descriptions MUST be based on a program language definition independent of the service interface required for systems to control the messaging system for the purpose of sending and receiving messages. These descriptions SHOULD identify the behavior of the messaging system required to:

- Realize reliable secure sending and receiving of messages over any network capable of carrying XML
- Support syntax-neutral definition of the information that needs to be retained
- Detail the format and structure of the wrapper, header, and any other data within the message - to include signatures and encryption
- Query ebXML servers (such as ebXML compliant message handling systems or registries) for the services they support

5.4.3 Extensibility

Businesses seek solutions that provide for a certain level of customization beyond core standards. This extensibility is necessary to ensure internally unique business process requirements can be addressed beyond the scope of standards used for information exchanges between businesses. One example of this requirement is customization beyond core standards to support exchanges within an enterprise. Another is customization to support application/database to human

exchanges. ebXML MUST ensure extensibility is facilitated while ensuring conformance with core standards.

5.4.4 Leveraging existing technology

Leveraging existing technology encompasses both the ability to inter-operate with existing technology as well as the ability to migrate to the new technology. Each of these is discussed in the following sub-sections.

5.4.4.1 Compatibility with existing Technology and EB standards and practices

Businesses already have in place extensive EDI architectures and business solutions based on accredited EDI standards; and customized sub-sets in the form of implementation conventions based on those standards. Additionally, many businesses are implementing XML solutions that are based on the technical specifications issued by the World Wide Web Consortium (W3C) and the XML-based business standards of various competing XML groups—such as RosettaNet, BizTalk, XML.ORG, the Open Applications Group (OAG). Although the ebXML solution will facilitate a single global electronic market, and although its technical framework will provide a single set of technical specifications, businesses will still require the ability to inter-operate their existing EDI and XML solutions with solutions built on the ebXML framework.

As part of compatibility, businesses require a technical framework that reuses common elements regardless of syntax. To ensure a syntax neutral solution, ebXML MUST identify and define those items considered common across XML business data exchanges. Common items are semantic units at any level that stay consistent across contexts, and therefore are reusable both within and between business exchange messages. Business process models will help define common items and provide their context. This context will in turn define the precise use of common items in messages exchanged among parties. ebXML MUST describe these items in terms that are independent of implementation syntax. This syntax neutral approach will enable their reuse for not only XML documents, but other syntax-based transactions as well.

The ebXML technical framework MUST adopt—or if needed, develop—a methodology to consistently build or derive core components, including methods to encourage reuse and provide for extensions. ebXML MUST identify element names that can apply across business processes and contexts yet still allow for translation into leading spoken languages. All ebXML work SHALL generate the content of core components independent of implementation syntax, but with references to data structures in XML messages and EDI transactions. The ebXML solution SHALL identify attributes that describe the context of the components also in terms independent of syntax.

5.4.4.2 Migration from existing EDI and XML solutions

Businesses seek maximum interoperability between their applications and trading partner applications. This can be achieved by a single way of doing business electronically, i.e., a single standard for using XML for electronic business. However, many businesses also have a

considerable investment in existing standards-based EDI and emerging XML business approaches. These businesses require a mechanism and migration path for accommodating legacy EDI solutions based on accredited standards and XML solutions already in progress or implemented. Although migration from existing EDI and XML solutions is a key element of ebXML, the ebXML solution will ensure maximizing interoperability takes precedence in developing the ebXML technical specifications.

Note It is beyond the current scope of the ebXML initiative to develop specific migration and transformation methods to include mapping services, communication channels, and architecture support from traditional EDI architectures.

5.5 Security

Businesses have a high level requirement that appropriate security technology be applied to protect information involved in business processes. Aspects of security may be required at various layers of a business process; at an outsourcing/transaction layer, at a session layer (i.e., for the duration of a network session in which data is exchanged) or applied to a single, stand-alone document instance. In addition, application of security to a particular exchange or document instance MUST be determined by the business needs, and allow unrestricted and unsecured interchanges if the business process requires this. All, some, or no security features may be required in any particular exchange of business information. The following requirements are general security definitions:

- Confidentiality - Only sender and receiver can interpret document contents
- Authentication of sender - Assurance of the sender's identity
- Authentication of receiver - Assurance of the receiver's identity
- Integrity - Assurance that the message contents have not been altered
- Non-repudiation of Origin - The sender can not deny having sent the message
- Non-repudiation of Receipt - The receiver can not deny having received the message
- Archiving - It MUST be possible to reconstruct the semantic intent of
- a document several years after the creation of the document

The understanding of these security requirements is also subject to the following related requirements; Legal, Digital Signatures, Interoperability, and Third Party Trust relationships. For example; The Archiving, Authentication, and Non-Repudiation of Origin and Receipt may be performed by a trusted third party through which the Parties to a transaction agree to channel transaction messages in order to provide independent historical proof that the transaction took place at a specific time and on specific terms. This time period is subject to the archiving and

record retention requirements of particular situations. In general, businesses might require archiving and retrieval of up to 30 years after document creation.

5.5.1 Legal

Beyond the security requirements identified in section 6.5, the following additional legal requirements exist:

- Comply with the requirements of UN/CEFACT recommendation 14 - Authentication of Trade Documents by Means Other Than Signature[13]
- Provide versioning support to facilitate reconstructing the semantic meaning of transactions in accordance with the underlying transaction format used
- Ensure full audit capability is supported
- Ensure all transmitted data is well defined by a minimal set of metadata
- Ensure a mechanism provides for identifying completeness of a transaction

5.5.2 Digital signatures

Digital signatures, or electronic signatures, have security and legal implications that directly affect electronic business requirements. As more and more government bodies define digital signatures, and enact legislation that adopts such techniques as having the same force of law as traditional signatures, new technology solutions MUST accommodate these business requirements.

The following definition and statement of compliance requirements is taken from Article 6 of UN Commission on International Trade Law, Working Group on Electronic Commerce, Draft Guide to Enactment of the UNCITRAL Model Law on Electronic Signatures (A/CN.9/WG.IV/WP.88):

1. Where the law requires a signature of a person, that requirement is met in relation to a data message if an electronic signature is used which is as reliable as was appropriate for the purpose for which the data message was generated or communicated, in light of all the circumstances, including any relevant agreement.

2. Paragraph (1) applies whether the requirement referred to therein is in the form of an obligation or whether the law simply provides consequences for the absence of a signature.

[13] *Authentication of Trade Documents by Means Other Than Signature*, Recommendation No. 14, second edition, adopted by the Working Party on Facilitation of International Trade Procedures, UN/ECE, TRADEWP.4/INF.63, March 1979 http://www.unece.org/cefact/rec/rec14en.htm

3. An electronic signature is considered to be reliable for the purpose of satisfying the requirement *referred to in paragraph (1) if:*

   a.) the signature creation data are, within the context in which they are used, linked to the signatory and to no other person

   b.) the signature creation data were, at the time of signing, under the control of the signatory and of no other person

   c.) any alteration to the electronic signature, made after the time of signing, is detectable; and

   d.) where a purpose of the legal requirement for a signature is to provide assurance as to the integrity of the information to which it relates, any alteration made to that information after the time of signing is detectable.

The ebXML technical framework MUST support electronic transactions that provide for electronic signatures at an appropriate level within the transaction to meet requirements of both the sender and receiver in keeping with the forgoing definition and attributes.

5.6 Management

If ebXML is to be successful in both the short and long term, and if the ebXML technical framework is to be adopted by the international business community, then management issues associated with both organizational structure and participation MUST be addressed. The following sub-sections identify the business requirements for each of these areas.

5.6.1 Organizational structure

The ebXML initiative is an eighteen-month effort to develop a technical framework. To ensure efficiency of operation and success in achieving the ebXML vision, sufficient organizational controls MUST be put in-place as quickly as possible. Further, there exists the possibility that ebXML will become more than a short term initiative. As such, long-term requirements for managing ebXML MUST be defined and addressed in the near term to ensure a smooth transition from short- to long-term management. Further, if such a long-term organization becomes reality, processes MUST be adopted for recasting ebXML as an internationally accredited standards body.

5.6.2 Participation

The ebXML initiative relies heavily on technical expert participation. This participation MUST be free of organizational requirements that restrict or otherwise inhibit participation of anyone. Further, participation SHOULD be limited to the individual and not at the organizational level.

This will ensure each technical expert is given an equal footing in the organization, management, and work effort of ebXML.

6 ebXML Technical Framework Requirements

This section identifies specific requirements for achieving the ebXML technical framework through the work of each of the ebXML project teams. These requirements have been developed in close coordination with those project teams to ensure consensus on their content. These high level requirements are closely aligned with the business requirements in section two of this document and are consistent with the vision, purpose, scope and guiding principles contained in Section Five. These high level requirements are carefully designed to provide a road map for the respective project teams as they drill down to more detailed requirements in preparation for developing their ebXML deliverables. As each of these deliverables becomes a reality, they will contribute to the developing ebXML technical specifications as part of building the ebXML technical framework as illustrated in Figure 6-1.

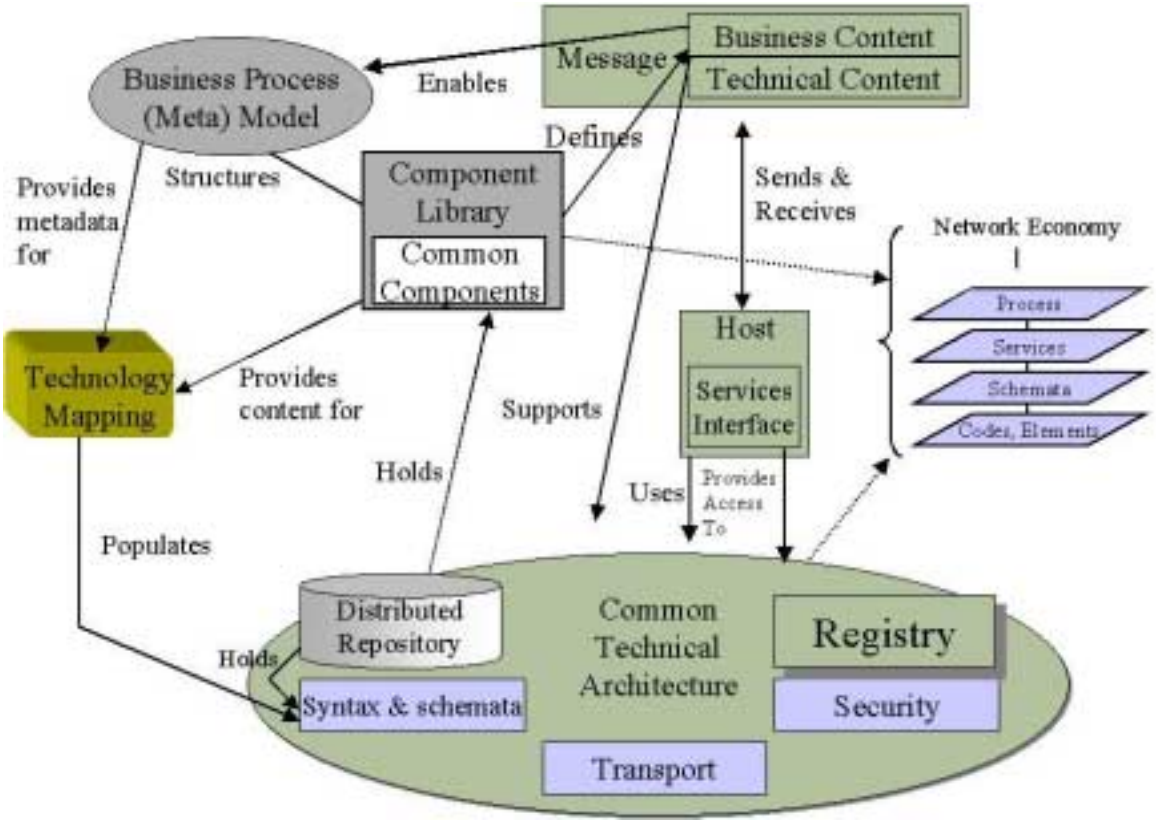

Figure 6-1: ebXML Technical Framework

6.1 General requirements

The following general requirements, in conjunction with the business requirements stated in Section Six, apply to each project team. Deliverables for each of the project teams MUST -

- Be developed in compliance with the purpose, scope, and guiding principles identified in Section Five
- Meet the business needs articulated in Section Two
- Be fully compliant with approved ebXML technical specifications
- Clearly identify core, mandatory features, and optional features
- Clearly define conformance requirements
- Support the requirements of each project team as identified in the following sub-sections.

6.2 Requirements

The *Requirements Project Team's* initial task was to produce this *ebXML Requirements Specification*. In addition, the *Requirements Project Team* SHALL:

- Develop follow-on requirements documents in support of the ebXML Executive Committee and ebXML Steering Committee that meet the requirements contained in section 4 of this document
- Review, evaluate, and assimilate follow-on requirements submitted by external organizations for consideration by ebXML
- Provide assistance as required to the *Quality Review Team* on ebXML requirements issues to include at a minimum a requirements traceability matrix

6.3 Business process

The *Business Process Project Team* detailed requirements and deliverables SHALL:

- Provide a technical specification for business process definition (BPDS), enabling an organization to express its business processes so that they are understandable by other organizations, thereby enabling integration of business processes (See for example eCo strategic framework - services and interactions)

- Provide an explicitly specified process metamodel that is not merely implied by instantiations or derivations
    - the metamodel SHALL provide set of rules to define the business processes—rules, semantics and syntax
- Provide a BPDS that is usable -
    - globally
    - cross-industry
    - by small, medium, and large organizations
    - by for-profit, government, and non-profit organizations
- Provide a BPDS that enables an organization to express its business processes to such an extent that other organizations can discover -
    - the kind of organization the process belongs to
    - the business processes belonging to an organization
    - the interaction points in the organization’s business process in order to determine whether and how to engage in business
    - the kinds of information exchanges required to conduct a particular interaction in the business process
    - company interactions, and services and categorizations of them
- Provide for BPDS compatibility by -
    - allowing for forward migration from existing frameworks to the degree possible
    - carrying forward accumulated best of breed experience such as—OAG, RosettaNet, HL7—into the ebXML "superset"
    - enabling mapability between content provider defined processes
    - enabling organizations or industry verticals to be able to compare business processes
- Provide for BPDS re-usability/extensibility by -
    - allowing a company to ‘re-use’ and extend standard, template, or actual business processes as starting points for definition of specific business processes

- encouraging industry verticals to base their model on the high level framework
- supporting re-usable data components
- supporting re-usable process components

- Enable business processes to be accessible and readable by -
  - making BPDS-based processes machine readable
  - expressing processes defined under BPDS in parsable, navigable XML
  - making processes defined under BPDS visually (diagrammatically) viewable
  - identifying at least one industry standard based tool or technique, through which BPDS compliant processes can be defined through diagrammatic drawing

- Provide a process to create and maintain a -

  Note This process SHALL be developed in coordination with the *Core Components Project Team's* developing process for identifying core components.

  - glossary of terms related to business process methodology vocabulary such as—functional, non-functional, vertical, message, segment, data type—using TMWG Unified Modeling Methodology document Annex 1 as a starting point
  - glossary of terms specific to each business process to be modeled
  - glossary of XML tags
  - library of documents based on identified services and interactions
  - web site for ready access to glossaries

- Be developed in conjunction with the *Registry and Repository Project Team* to incorporate technical specifications, models, and required glossaries into the ebXML repository

6.4 Technical architecture

The *Technical Architecture Project Team* detailed requirements and deliverables SHALL:

- Provide a view for integration of business processes among ad-hoc or established independent business partners by electronic means

- Reduce the need for collaborative business partners to have individual and expensive prior agreement on how to integrate business processes
- Provide a high-level business-centric view of distributed e-business processes
- Specify the roles, interactions, and interfaces among the various ebXML specification components such as—the business process metamodel, core components, registry and repository, message handling, and collaboration profiles and agreements.
- Allow for both business processes and enabling technologies to evolve independently while retaining long-term investments in both
- Integrate with new and legacy systems throughout the enterprise
- Leverage existing technologies and standards
- In coordination with BP process specification and core components identification, provide for naming conventions for technical and business content in the technical architecture
- Provide design guidelines for ebXML compliant messages

6.5 Core components

The *Core Components Project Team* detailed requirements and deliverables SHALL:

- Be developed in conjunction with the *Business Process Project Team*
- Identify a methodology for describing core components within the framework of the Business Process metamodel
- Define core component content and structure
- Support “re-use” and extensibility
- Provide methodology and examples for XML and EDI instantiation
- Enable creation of XML business standards

The *Core Components Project Team* SHALL develop core components that SHALL:

- Be syntax independent

  Note Core components SHALL not be specifically aligned with any existing syntax based semantics such as ANSI ASC X12 or UN/EDIFACT.

- Be defined to ensure separation of common core components versus new extensions
- Incorporate where appropriate ISO/IEC 11179 rules[14] [15] [16] [17] [18] [19]
- Use semantics solutions that accommodate currently defined accredited EDI semantics where they add value
- Use a single consistent set of terminology
- Support context sensitive core components

6.6 Transport/routing and packaging

The *Transport/Routing and Packaging Project Team* detailed requirements and deliverables SHALL:

- Specify how to envelope business documents in regard to -
  - related messages in a collection
  - physical and/or logical addressing of destination for messages
- Specify exchange at the application level
- Provide for flexible transaction boundaries
- Provide for reliable messaging and error handling
- Identify messaging routing
- Meet security requirements
- Provide for audit trails

---

[14] *Information Technology — Specification and standardization of data elements -- Part 1: Framework for the specification and standardization of data elements,* International Standardization Organization, ISO 11179-1, 1999 http://www.iso.ch

[15] *Information Technology — Specification and standardization of data elements -- Part 2: Classification for data elements*, International Standardization Organization, ISO 11179-2, 2000 http://www.iso.ch

[16] *Information Technology — Specification and standardization of data elements -- Part 3: Basic attributes of data elements*, International Standardization Organization, ISO 11179-3, 1994 http://www.iso.ch

[17] *Information Technology — Specification and standardization of data elements -- Part 4: Rules and guidelines for the formulation of data definitions*, International Standardization Organization, ISO 11179-4, 1995 http://www.iso.ch

[18] *Information Technology — Specification and standardization of data elements -- Part 5: Naming and identification principles for data elements*, International Standardization Organization, ISO 11179-5, 1995 http://www.iso.ch

[19] Information Technology — *Specification and standardization of data elements -- Part 6: Registration of data elements*, International Standardization Organization, ISO 11179-6, 1997 http://www.iso.ch

- Define and meet acceptable levels of quality of service
- Support platform independent interoperability
- Support restart and recovery

Note For additional technical details, see the Transport, Routing, and Packaging detail requirements specification.

6.7 Registry and repository

The Registry and Repository Project Team detailed requirements and deliverables SHALL develop detailed blueprints for an ebXML Registry that:

- Uses an open management processes
- Has open and perpetually free access
- Supports technical specification submission and management
- Supports required system services

6.7.1 Technical specification submission and management

The registry and repository specifications SHALL address:

- Technical specification storage and retrieval for development and run-time views
- Object Storage - the ability to store objects in their original form, not limited to -
    - ebXML CPP/CPA/Business Process Schema
    - classification schemes
    - code lists
    - related data, example instances of document definitions, executable code, style sheets
    - relationships between objects, e.g., storage of semantically equivalent objects
- A flexible life cycle management, e.g., deprecation and removal
- Support for a role-based security model

- Support for work request submissions to store associated supporting materials in any electronic format, e.g., PowerPoint documents, audio files, images

- Indexing of metadata across all entries in Registry

6.7.2 Required system services

The Registry and Repository specifications SHALL address the following required services.

- Query services the ability to send a request and retrieve results from a physical storage mechanism, e.g., exact or similar matches and navigation

- Logging services the ability to store transactional events, query events, and metrics

6.8 Trading partner

The *Trading Partner Project Team* detailed requirements and deliverables SHALL:

- Define a collaboration-protocol profile (CPP) by which a party can be found through a discovery process. The profile indicates what kind of electronic business-to-business interactions the party is capable of conducting. The CPP defines the technical components of the interactions, such as supported communication profiles, security information, general messaging specifications, and the definition of the collaborative processes that the party supports in interactions with other parties. Multiple profiles for specific processes, locations, individuals, and systems can exist within a single organization.

  Note The discovery process itself as a business process that is not within the scope of the Trading-Partner team.

- Define a collaboration-protocol agreement (CPA), which records agreement between two parties on how to do electronic business with each other. The CPA can be viewed as the intersection of the two parties' CPPs. It defines the common technical capabilities and the particular services that each provides to the other.

  Note It is a long-term goal to extend the CPA to define multiparty interactions.

- Define the content of the CPP such that a software process can compose a CPA from the CPPs of the two parties.

- Define the CPA such that it serves the purpose of a configuration document that can be used to configure the two parties' run-time systems to perform the desired business.

- Work with the Transport-Routing-Packaging team to ensure that the CPP/CPA provides the needed support for message exchanges and that the message header provides the fields needed to support electronic business under control of a CPA.

- Define the collaborative processes that the party can engage in with another party based on the ebXML model for the business process. Elements of the definition include:
  - The requests that can be sent to the party
  - The business document schema for each request
  - The response messages that can be sent as a result of each request
  - The choreography of the message exchanges

6.9 Proof of concept

The *Proof of Concept Project Team* detailed requirements and deliverables SHALL facilitate developing prototype demonstrations for ebXML technical specifications. These prototype demonstrations SHALL:

- Demonstrate feasibility and interoperability of each of the ebXML technical specifications within a business domain
- Demonstrate viability of overall ebXML technical framework

7 ebXML Organizational and Procedural Requirements

The ebXML Executive Committee MUST put in place organizational and procedural processes as soon as possible. These organizational and procedural processes are critical to enable the various ebXML project teams to make sound decisions in developing their requirements and deliverables. These organizational and procedural processes MUST:

- Facilitate the efforts of the *Requirements Project Team* and the various Executive Committee support teams identified in Section Seven.
- Support each of the functional project teams to meet their requirements

In developing these organizational and procedural processes, the Executive Committee SHALL:

- Follow the purpose, scope, and guiding principles identified in Section Five
- Meet the business needs articulated in Section Six
- Facilitate the general requirements in Section Seven
- Support the requirements of each project team as identified in Section Seven

These organizational and procedural processes MUST provide for

- An open and consensus driven ebXML management process
- An open, timely, and consensus driven ebXML products development process that
    - is responsive to business needs
    - has sufficient controls to prevent creation of equivalent components
- An open, timely, and consensus-driven ebXML technical specifications approval process that is responsive to business needs

Additionally, the Executive and Steering Committees, in conjunction with the full ebXML Working Group MUST determine:

- The requirements for short- and long-term ebXML relationships with UN/CEFACT, W3C, ANSI, ISO and other standards bodies

- The requirements for short- and long-term ebXML relationships with OASIS, BizTalk, RosettaNet, OAG, and other XML business standards bodies
- A common ebXML technical specification template to be utilized by each of the project teams in developing their technical specifications
- The appropriateness of moving ebXML technical specifications to recognized international standards under the cognizance of an international standards body
- The single body that is responsible for long term maintenance of the ebXML technical specifications, repository, and supporting mechanisms - OASIS, UN/CEFACT, or ebXML
- The process for long term maintenance of the ebXML technical specifications
- ebXML funding methodology
- The need for and definition of measures of success

7.1 Executive Committee support

To help meet the requirements identified above, the Executive Committee has established three Executive Committee support teams. The requirements for these support teams are contained in the following subsections.

7.1.1 Quality review

The *Quality Review Team* SHALL review all candidate technical specifications prior to each public review period and final vote and SHALL identify via clear, concise written documentation:

- Deviations from the overall requirements specifications
- Deviations from the ebXML traceability matrix
- Completeness
- Technical consistency within the overall ebXML technical framework.
- Proposed solutions to identified problems or gaps where deemed appropriate by the QR team
- The *Quality Review Team* SHALL consider the following features of the candidate material:
- Scope and alignment with ebXML vision
- Completeness

- Satisfies ebXML requirements
- Consistency with Technical Architecture
- Consistency with component naming rules
- Addresses Security Risk Assessment document
- Editorial quality, that is…
  - uses ebXML template
  - adheres to the ebXML documentation style guidelines
  - uses consistent language (glossary)
  - uses correct grammar
  - uses correct spelling
  - avoids unsubstantiated rhetoric
  - contains no logical inconsistencies
  - contains no 'placeholders' for future content
  - provides adequate exposition and clarity of meaning
  - uses appropriate diagrams, examples and sample source code
  - maintains a structural integrity
  - avoids ambiguity
- In addition, the Quality Review Team SHALL be responsible for project management support to include:
- Capturing the deliverables from the project teams
- Using the deliverable information to create and maintain a project plan that identifies the critical milestones and deliverables of the ebXML initiative
- Facilitating visibility to all ebXML project teams of the relationships between the critical ebXML deliverables
- Providing risk assessment analysis for the Executive Committee on any critical area that may impact meeting the ebXML timeline

7.1.2 Marketing awareness

The true measure of success for ebXML will be in its adoption by the business community. To help facilitate that adoption, the *Marketing Awareness Support Team* SHALL:

- Create an ebXML awareness program
- Define general ebXML web site content and management approaches
- Define allowable content of ebXML Project Team public pages
- Define and execute ebXML marketing communications
- Promote and support regional ebXML promotion efforts

8 ebXML Project Team Deliverables

This section identifies the major specifications that SHALL be delivered by each of the ebXML project teams. It also describes in general terms the expected nature of the various ebXML project team deliverables to guide each team in developing those deliverables and ensure a single consistent approach.

8.1 Major ebXML technical specifications

The major ebXML technical specifications to be delivered SHALL consist of the:

- Technical Architecture Specification - contains an overview of the technical infrastructure that comprises ebXML and itemize the design rules and guidelines
- Repository and Registry Specification - includes functional specification and technical design, interfaces, services
- Transport, Routing and Packaging Specification - addresses transport of ebXML messages, the means of security employed, and the physical construction of the messaging used within the scope of the ebXML system. Specific deliverables SHALL include -
  - message structure specification
  - message header specification
  - a textual API example
  - choreographic of messages
  - security specification
- Business Process Modeling Specification - the business process metamodel and the recommended methodology for using it
- Core Components Specification - The set of ebXML core components and the prescribed methodology for deriving them
- Trading Partner Specification - A collaboration profile template that supports manual and electronic discovery and agreement

To assist in visualizing the above, Figure 8-1 is a conceptual model of overall ebXML stack interactions.

Figure 8-1: ebXML Stack Interactions

9 Disclaimer

The views and specification expressed in this document are those of the authors and are not necessarily those of their employers. The authors and their employers specifically disclaim responsibility for any problems arising from correct or incorrect implementation or use of this design.

10 Contact Information

Team Leader

Michael C. Rawlins

Rawlins EC Consulting

PMB 29

14 Canyon Creek Village

Richardson, TX 75080-1602

USA

Phone: 972-783-8573

EMail: rawlins@metronet.com

Editor

Mark Crawford

Logistics Management Institute

2000 Corporate Ridge

McLean, Virginia 22026

USA

Phone: 703-917-7177

Email: mcrawford@lmi.org