Universal Business Language: Realizing eBusiness XML

Mark Crawford, LMI
UBL Vice Chair
Why Are We Talking About UBL

• UBL fulfills the promise of XML for business by defining a standard cross-industry vocabulary
• UBL is the ebXML missing link
• UBL plus ebXML enables the next generation of EDI
  – Cheaper, easier, Internet-ready
  – Extends benefits of EDI to small businesses
  – Fits existing legal and trade concepts
  – Allows re-use of data
• UBL can provide the XML payload for a wide variety of other web-based business frameworks
Goals for Successful eBusiness Services

- Web-enable existing fax- and paper-based business practices
- Allow businesses to upgrade at their own pace
- Preserve the existing investment in EDI
- Integrate small and medium-size businesses into existing EDI-based supply chains

The standardization of XML business documents is the easiest way to accomplish these goals.
The Problem Is

Repetition of "Tower of Babel"
Same mistakes as EDI
Reengineering the Standards Process

**TODAY**
(informal description)

- Example Information flow
- Validation rules
- Usage guidelines
- Field specs
- Scope
- Format specs

**TOMORROW**
(rigorous and formal description)

- Business Analysis
- Requirements Analysis
- Logical Analysis
- Message Design
- Technical Design
- Technical Implementation

**BUSINESS MODELS**

**COMPONENTS**

**DOCUMENTS**

**XML CODE**

**Purchase Order**

<table>
<thead>
<tr>
<th>Sender</th>
<th>Recipient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Position

Account Summary

**Business Documents**

**XML**

<xml>

<ubl:Document>
  <ubl:AccountSummary>
    <ubl:AccountNumber>12345678</ubl:AccountNumber>
    <ubl:AccountType>checking</ubl:AccountType>
  </ubl:AccountSummary>
</ubl:Document>
The Success of XML Business Standardization

Dead End

Merging traffic ahead

No Forward-Looking Standards

EXIT

Standard Org. A

Standard Org. B

Standard Org. C

Standard Org. D

Standard Org. E

Standard Org. F

Standard Org. G

Standard Org. H

Standard Org. I
Criteria For Successful XML Business Standardization Efforts

- User-driven
- Focused on global requirements
- Clear development process and high quality documentation
- Reuse of existing standards
- Modularized structure
So – What Is The Answer?
The ebXML Initiative

• A joint UN/CEFACT and OASIS 18-month effort, concluding in May 2001
• Over 1000 international participants from both XML and Business Communities
• The vision: a global electronic marketplace where enterprises of any size, anywhere, can:
  – Find each other electronically
  – Conduct business by exchanging XML messages
• Initial product is a technical framework that enables XML and other payloads to be utilized in a consistent manner for the exchange of all electronic business data
• ebXML work continues in OASIS and UN/CEFACT
The ebXML Construct
So What About Standard Payloads?

- Not Part of Phase 1
- No mention in Phase 2
- Core Components provide a basis for standardization, but not syntax specific expressions
So – What Is The Answer?
ebXML Core Components are “syntax neutral“, it will be a basis for multiple business document dialects and standards

- ebXML Core Components
- ebXML compliant syntax-implementations
  - XML
  - UN/EDIFACT
  - X.12
  - UN Layout
  - etc.

- But we must have concrete standard XML syntax to enable wide use and cheap commercial software
- Given a concrete XML syntax for business, users will adopt it

UBL is developing XML business document design rules, XML syntax core component (CC) structures and ebXML (UN/CEFACT) CC compliant XML document schemas
UBL’s Relationship with ebXML

• UBL is committed to international semantic standardization
• UBL is committed to, and fully conformant with, the CCTS
• UBL is not actually an ebXML deliverable – Yet!
• UBL does not mandate a particular framework, but is built to support ebXML
Overview

1. Evolution & Success of Business Standards
2. The Role of ebXML
3. Relationship with ebXML
4. Core Components
5. UBL Overview
6. The XML Stuff
7. The Business Standards Stuff
8. Working with Liaisons
9. Summary
ebXML Core Components

• A set of the lowest common denominator that captures information about a real world (business) concept

• Core Components are neutral
  – in the notation for every kind of industry
  – in the syntax for every kind of business document standard or implementation
ebXML Core Components

- Reusable pieces (objects) of contents that can be atomic or aggregate
  - Enables interoperability among different industry domains and areas
  - Are using common semantic units at any level consistent across context
  - Hold any related information together and avoiding fragmented semantic dispersal
  - Facilitate multilingual support

- Accompanied by methodology for extensibility
  - Enable users to define meaningful business and process data
  - Ensure maximum interoperability
The Core Components Specification Follows ISO 11179

Object class

Property 1: representation 1
Property 2: representation 2
Property 3: representation 3
Property 4: representation 4

Address

Street: text
Post code: text
Town: text
Country: identifier

ISO 11179 governs data dictionaries:
defines the notions of object class, property, and representation term

- This is basic object-oriented “good stuff”
Overview

1. Evolution & Success of Business Standards
2. The Role of ebXML
3. Relationship with ebXML
   Core Components
4. UBL Overview
5. The XML Stuff
6. The Business Standards Stuff
7. Working with Liaisons
8. Summary
So What is UBL?

UBL is:
- Jon Bosak’s brainchild
- An OASIS Technical Committee
- An implementation of ebXML Core Components
- An XML-based business language standard-in-progress
- A cross-sector XML solution
- A Non-proprietary solution that is committed to freedom from royalties
- A future legal standard for international trade
- The ebXML missing link
UBL’s Benefits

• Transparent and efficient interface naming and design rules
• Harmonization and standardization of business objects
• Transparent rules for customer specific interface modifications
• Plugs directly into existing traditional business practices
• Interoperable with existing EDI systems
UBL Development Strategies

• Start with the low-hanging fruit
  – The 20% of documents and business objects actually used by 80% of electronic business partners

• Defer the rocket science to later phases
  – Produce useful, concrete outputs ASAP

• Don’t start with a blank slate
  – We are working from xCBL 3.0
  – But with no expectations of backwards compatibility

• Take advantage of domain expertise
  – Get XML experts and business experts together and form liaisons
UBL Deliverables

- Naming and design rules for UBL XML schemas
- Library of standard XML business information entities (BIEs)
- Set of standard XML business documents (purchase order, invoice, shipping notice, price catalogue, etc.)
- Context methodology to make the standard documents interoperate across industries

Timeline:
- NDR, CC/BIE library, and basic documents: early 2003
- Context methodology and assembly: Fall 2003
Basic UBL Documents

• **Procurement**
  – Purchase Order, P.O. Response, P.O. Change

• **Materials management**
  – Advance Ship Notice, Planning Schedule, Goods Receipt

• **Payment**
  – Commercial Invoice, Remittance Advice

• **Transport/logistics**
  – Consignment Status Request, Consignment Status Report, Bill of Lading

• **Catalogs**
  – Price Catalog, Product Catalog

• **Statistical reports**
  – Accounting Report
Some UBL Participants

<table>
<thead>
<tr>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>APACS</td>
</tr>
<tr>
<td>Aeon Consulting</td>
</tr>
<tr>
<td>ACORD</td>
</tr>
<tr>
<td>Boeing</td>
</tr>
<tr>
<td>Commerce One</td>
</tr>
<tr>
<td>Danish Bankers Association</td>
</tr>
<tr>
<td>France Telecom</td>
</tr>
<tr>
<td>General Electric</td>
</tr>
<tr>
<td>Government of Hong Kong</td>
</tr>
<tr>
<td>Government of Korea</td>
</tr>
<tr>
<td>HP</td>
</tr>
<tr>
<td>IBM</td>
</tr>
<tr>
<td>KPMG</td>
</tr>
<tr>
<td>LMI</td>
</tr>
<tr>
<td>Northrop Grumman</td>
</tr>
<tr>
<td>Ontogenics</td>
</tr>
<tr>
<td>Oracle</td>
</tr>
<tr>
<td>PricewaterhouseCoopers</td>
</tr>
<tr>
<td>SAP</td>
</tr>
<tr>
<td>SeeBeyond</td>
</tr>
<tr>
<td>Sterling Commerce</td>
</tr>
<tr>
<td>Sun Microsystems</td>
</tr>
<tr>
<td>U.K. Cabinet Office</td>
</tr>
<tr>
<td>United Parcel Service</td>
</tr>
<tr>
<td>U.S. General Services Administration</td>
</tr>
<tr>
<td>U.S. Navy</td>
</tr>
<tr>
<td>Visa International</td>
</tr>
</tbody>
</table>
UBL Subcommittees

NDRSC
Naming and Design Rules SC
Develops guidelines for normative-form schema design, instance design, and markup naming,

CMSC
Context Methodology SC
Develops a methodology and tools for applying context.

CDSC
Context Drivers SC
Works on improvement and further development of the context drivers.

TTSC
Tools and Techniques SC
Evaluates and recommends the tools and techniques for development, maintenance and revision

LCSC
Library Content SC
Defines business documents and a library of XML and ebXML CCTS based building blocks

ASC
Administration SC
Administrates and coordinates the UBL efforts

MSC
Marketing SC
Does marketing and promotion for the UBL effort

LSC
Liaison SC
Organizes liaisons with other organizations.
Overview

1. Evolution & Success of Business Standards
2. The Role of ebXML
3. Relationship with ebXML
4. Core Components
5. UBL Overview
6. The XML Stuff
7. The Business Standards Stuff
8. Working with Liaisons
9. Summary
UBL Naming and Design Rules Subcommittee

• Chairs:
  – Mark Crawford <mcrawford@lmi.org>
  – Lisa Seaburg <lseaburg@midsouth.rr.com>
  – Mavis Courname <mavis.cournane@cognitran.com>

• Archive: http://lists.oasis-open.org/archives/ubl-ndrsc

• Web page: http://oasis-open.org/committees/ubl/ndrsc/
NDR Requirements

- Leverage XML technology, but keep it interoperable
- Achieve semantic clarity through a binding to the Core Components model
- Support contextualization (customization) and reuse
- Selectively allow “outsourcing” to other standard schemas
Some Major Design Rules Developed So Far

- The choice of normative schema language - XSD
- Garden of Eden design approach
- Naming and construction of elements, attributes, and types
- Modularity, namespaces, and versioning
- Embedded schema documentation
- Handling code lists
A Taste Of The Naming Rules

- Dictionary entry names are fully qualified with object class names
- But using these full names would result in hundreds of extra elements
- We get reusability by allowing properties (elements) to "inherit" parent object classes (types), XPath-style
  - Delivery schedule IDs and order IDs could both be called <ID>
  - Each would be identifiable by means of //Order/ID and //DeliverySchedule/ID respectively
Encoding Code Lists

• UBL will seek to import external datatype definitions in conventional XSD form
  – Validation
  – Clarity
• We are developing a schema for promotion as an international standard
• We hope to promote a global code list marketplace
UBL Context Methodology Subcommittee

- Chair: Matthew Gertner
  <matthew.gertner@schemantix.com>
- Editor: Eduardo Gutentag
  <eduardo.gutentag@sun.com>
- Archive: http://lists.oasis-open.org/archives/ubl-cmsc
- Web page: http://oasis-open.org/committees/ubl/cmsc/
The Special Requirement For Context

• “Standard” business components need to be different in different business contexts
  – Addresses differ in Japan vs. the U.S.
  – Addresses in the auto industry differ from those for other industries
  – Invoice items for shoes need size information; for coffee, grind information

• UBL needs this kind of customization without losing interoperability
Context Methodology

• Defines how document formats can be extended based on specific trading partner characteristics
• Takes ebXML context drivers (8 space) and context rules as starting point
• Builds on experience with OO extension methodology, but will be
  – More structured
  – More consistent
  – Easier to track
  – Easier to automate
  – Require a lower level of skill
UBL defines BIEs, not CCs – they have a bit of real context in them
  - Typically just the business process
  - Everything else should ideally be “zeroed out”

A set of eight values identifies a unique business context
  - A trading community can associate their schema customizations with it
Overview

1. Evolution & Success of Business Standards
2. The Role of ebXML
3. Relationship with ebXML
   Core Components
4. UBL Overview
5. The XML Stuff
6. The Business Standards Stuff
7. Working with Liaisons
8. Summary
Chair: Tim McGrath
<tmcgrath@portcomm.com.au>
Vice Chair: Marion Royal
<marion.royal@gsa.gov>
Archive: http://lists.oasis-open.org/archives/ubl-lcsc
Web page: http://oasis-open.org/committees/ubl/lcsc/
The Inputs

- Documents/expertise from:
  - The members of the Library Content SC
  - Organizations with a liaison to the UBL TC
  - Feedback from the general public
- xCBL 3.0
  - A working XML business vocabulary for several years
  - Has lots of EDI knowledge baked into it
- ebXML CCs
  - Ultimately, as many UBL constructs as possible will be mapped to the final form of CCs
  - Where there’s no match, this will be fed back to the CC project
The Approach

Conceptual View (BOV)
logical models

Core Component

UNSM
Directories
Schemas

Technology View (FSV)
physical models

design

BIE
Context

Core Component

UNSM
Directories
Schemas

The Real World
messages/documents

analyze

encode

format

implement

DBs
Forms
XML

DBs
Forms
XML
Core Components vs. Business Information Entities

Core Component (CC)
A building block for the exchange of semantically correct and meaningful information

apply business context:
- business process
- product classification
- industry classification
- geopolitical region
- official constraint
- business process role
- supporting role
- system capabilities

Business Information Entity (BIE)
A CC to which a business context has been applied

- An address might be a generic CC
- A U.S. address has (at least) the geopolitical region set as its business context, making it a BIE
- UBL, by its nature, deals only in BIEs
The Modeling Steps

- Working from an xCBL document type, analyze its constituent constructs to identify BBIEs and ABIEs
- Establish each BIE’s dictionary name, UBL name, definition, and business context
- Establish its cardinality/optionality within its object class
- Identify missing BIEs
- Identify which BIEs are reusable
- Assemble an appropriate UBL document type from the BIEs
The Formalism

• Initially –
  – A spreadsheet with carefully designed columns

• Ultimately –
  – ebXML registered objects
A tiny sample data dictionary

<table>
<thead>
<tr>
<th>Person</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: text</td>
<td>Street: text</td>
</tr>
<tr>
<td>Birth: date</td>
<td>Post Code: text</td>
</tr>
<tr>
<td>Residence Address: Address</td>
<td>Town: text</td>
</tr>
<tr>
<td>Official Address: Address</td>
<td>Country: identifier</td>
</tr>
</tbody>
</table>

Key:
Object class (aggregate BIE)   Property (basic BIE)
Property (association BIE)     Representation term (CCT)

- This leaves out cardinality considerations for simplicity
The Back End

modeling

Spreadsheet

handcrafting

Schema module for CCTs

automated process

Schema modules for functional areas (e.g. Order)

Schema module for reusable BIEs
Overview

1. Evolution & Success of Business Standards
2. The Role of ebXML
3. Relationship with ebXML
4. UBL Overview
5. The XML Stuff
6. The Business Standards Stuff
7. Working with Liaisons
8. Summary
UBL Differentiators

- Completely open, public, accountable standards process
- Non-proprietary and royalty-free
- Based on UN, OASIS, and W3C specifications
- Intended for normative status under international law
- Designed for B2B
- Intended for exchange of legal documents
- Human- and machine-readable
- Compatible with existing EDI systems
Where UBL Can Fit Into Existing XML B2B

Electronics Mfr A \( \xrightarrow{UBL} \) Hospital B \( \xrightarrow{UBL} \) Chemical Mfr C

A’s industry partners \( \xrightarrow{RosettaNet} \)

B’s industry partners \( \xrightarrow{HL7} \)

C’s industry partners \( \xrightarrow{CIDX} \)
The Value of Joining Forces

• As a non-profit cross-industry effort, UBL depends on expert domain input to “get it right”
• We actively solicit industry and standards liaisons
• Organizations appoint representatives to the UBL Liaison Subcommittee
  - If the organization is not an OASIS member, an individual representative joins at USD 250/year
  - Telcons are held every two weeks
  - Liaisons arrange for specification reviews
Formal Liaisons So Far

- ACORD (insurance)
- ARTS (retail sales)
- e.centre (UK EAN.UCC)
- EIDX (electronics)
- HL7 (healthcare)
- NACS (convenience stores)
- RosettaNet (IT)

- SWIFT (banking)
- UIG (Utilities)
- VCA (optical supplies)
- XBRL (accounting)
- ASC X12 (EDI)
- ebXML Asia
- UN/CEFACT
  - TBG (Content)
  - ATG (XML Design)
ebXML CC and/or UBL Adoption Plans

• Organizations & Government
  – European Commission
  – US EPA
  – US DON
  – US GSA
  – Other US DoD
  – eBES (e-Business Board for European Standard by CEN/ISSS)

• De jure standards organizations
  – ANSI X12 UN/CEFACT

• Software Vendors
  – SAP
  – SUN Microsystems
  – Commerce One
  – Sterling Commerce
  – Oracle
  – SeeBeyond
Overview

1. Evolution & Success of Business Standards
2. The Role of ebXML
3. Relationship with ebXML Core Components
4. UBL Overview
5. The XML Stuff
6. The Business Standards Stuff
7. Working with Liaisons
8. Summary
Summary

• UBL is "the real deal" – actual standard XML business schemas
  – Completes the ebXML stack
  – Combines the experience of XML and business experts

• UBL is dedicated to vendor-neutral interoperability
  – Open process
  – Unencumbered IP
  – Cross-industry semantic harmonization

• UBL can enable the "B2B web"
  – HTML + HTTP = web publishing
  – UBL + ebXML = web commerce
Where To Find More Information

- **OASIS UBL TC**
  - www.oasis-open.org/committees/ubl/
  - www.oasis-open.org/committees/ubl/lcsc/
  - www.oasis-open.org/committees/ubl/ndrsc/
  - www.oasis-open.org/committees/ubl/cmsc/
  - White papers, presentations, and specifications are available
  - All mailing list archives are open to public view
- **ebXML**
  - www.ebxml.org
- **Core Components**
  - www.ebtwg.org
How To Comment

• The UBL comment list is open to all
  – Archive: lists.oasis-open.org/archives/ubl-comment
  – Signup: lists.oasis-open.org/ob/adm.pl

• The Library Content and NDR SCs have spreadsheet forms for providing feedback
Thanks!
Questions?

eve.maler@sun.com