

The Pursuit of an XML Framework

By Eddie Ho

In e-commerce, XML aids the exchange of information within organizations by allowing each to customize its own XML vocabulary and syntax. Conversely, a custom XML standard can hinder information exchange with other organizations because it may be incompatible with their particular XML standards. This article describes the efforts of several major organizations to create a universal XML standard, and thereby promote better data interchange.

Enterprise commerce is the large-scale trading of goods and services between groups of buyers and sellers. Collaborative trading extends this enterprise commerce framework to trusted trading partners, which can help facilitate the delivery of the right product, in the right quantity, at the right price, to the right location—all at the right time.

A traditional brick-and-mortar business consists of many building blocks, procedures, or trusted systems that manage suppliers, warehouses, Enterprise Resource Planning/Material Requirements Planning (ERP/MRP), and fulfillment. The interconnection of all these procedures has traditionally been a *de facto* process and vendor-specific, thus inhibiting convergence or standardization for efficiency (see Figure 1).

In order to advance to the next level of direct commerce in a global environment, businesses are using the Internet as a single point of integration for all components. In the midst of this evolution, Extensible Markup Language (XML) has emerged as the foundation of this trading model.

XML is the best technology for solving existing application integration problems that may be inhibiting electronic

commerce (e-commerce). Microsoft, Ariba™, CommerceNet®, and Hewlett-Packard (HP) are implementing XML standards, and efforts are underway to move Electronic Data Interchange (EDI) vocabularies into XML, through RosettaNet, the X12/TG3 workgroup, and Simple EDI from the United Nations Rules for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT).

XML Makes Information Exchange Easier

Before the emergence of the World Wide Web in 1992, only large organizations—usually retail and auto industries—could achieve e-commerce by using EDI to support their supply chain and distribution channel efforts. HyperText Markup Language (HTML) was designed as a display format, not as a means to exchange information.

The advent of XML, however, makes the exchange of information easier, letting users define their own language syntax. This is the power of XML 1.0, but also its weakness: It is too easy for an organization to create its own XML syntax that is incompatible with those of other organizations. These islands of information do not facilitate the exchange of data.

EDI Reveals a Lesson for XML

Organizations defining new XML languages may be solving their own specific problems, but they are not communicating solutions with others. Thus, they are making it harder to move information between themselves and other organizations outside their spheres of interchange. When EDI transactions encountered the same problem in the 1970s, organizations such as X12 and UN/EDIFACT were formed, and it took over a decade to achieve alignment between previously existing efforts. Even today, the alignment is still not complete.

Today, businesses cannot let this happen to the XML-based e-commerce movement. Unfortunately, there is no clear winner or predominant universal alternative to industries creating their own XML standard. This is the main reason why major organizations such as HP and CommerceNet are creating standards that are making other standards interoperable. Ariba and Microsoft are also attempting to capture the high ground and establish a dominant standard for the integrated commerce environment.

Emergence of the E-Commerce Framework

Three of these four efforts also differ from historic standards efforts because they represent more than simple standards—they are intended to be e-commerce frameworks. Frameworks are mechanisms that organize and help standards work together, offering multistandard integration, rather than being yet another competing standard. The three framework efforts include eCo by CommerceNet, BizTalk™ by Microsoft, and e-speak™ by HP.

No one involved in standards development believes only one standard will win out, but that many existing industry, national, and international standards will exist in the end. So, how will data move between these various standards? If it is necessary to identify each data element in each standard, and also how that data element must be represented in other standards (mapping) for each company using differing standards, e-commerce will come to a screaming halt.

To facilitate the movement of data, these mappings must be automated and retrievable from common registries

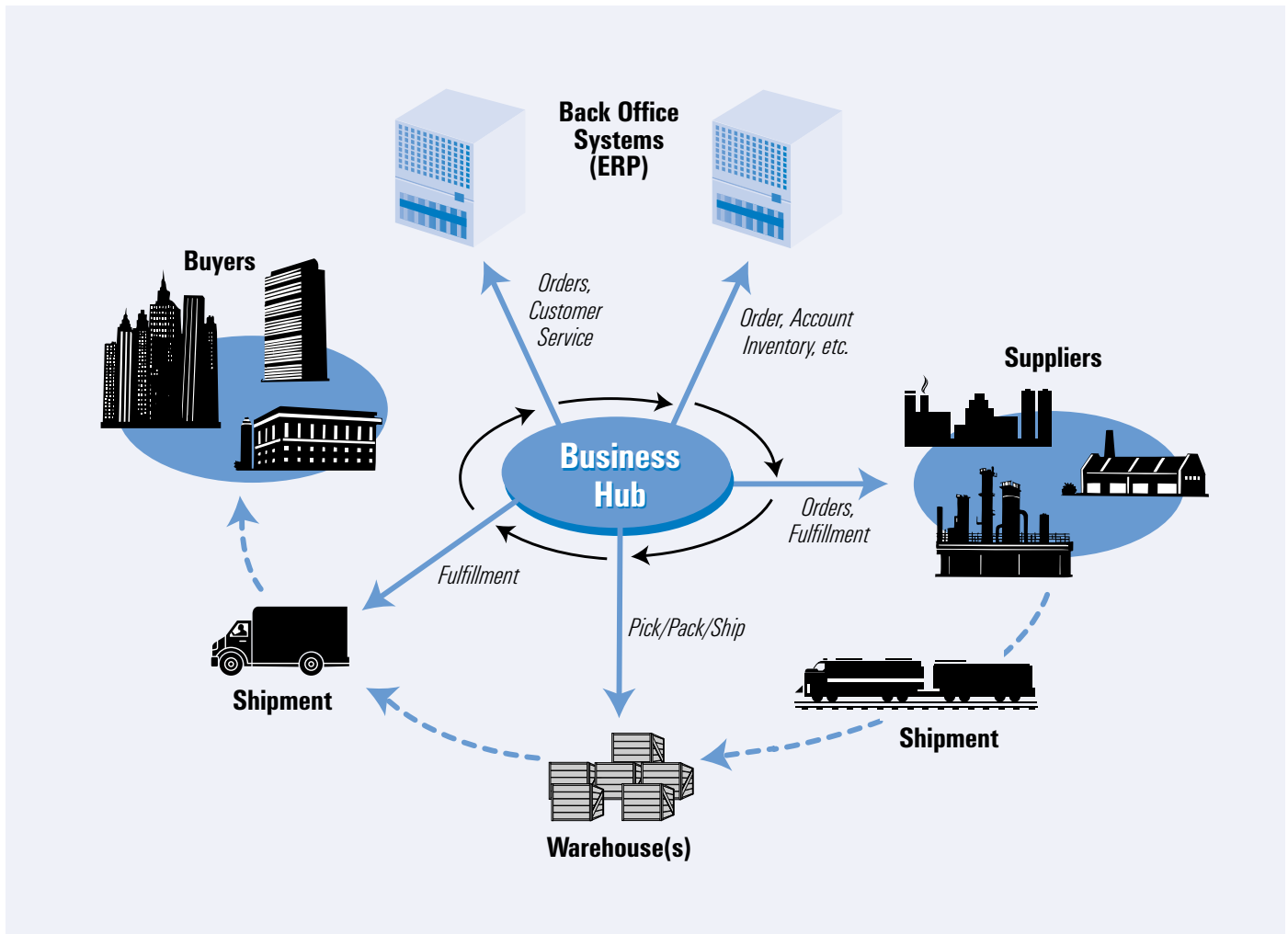


Figure 1. Collaborative Trading via the Business Hub

through a common means. Efforts to automate the discovery of common transaction protocols between possible trading partners and the resulting mappings are focused on defining the e-commerce framework.

Communication Requires Format and Architecture

E-commerce in a real-world environment consists of many discovery steps and layers, from physical layers to multiple logical interface layers, in a real-time learning process to arrive at a protocol agreement. The process includes identifying organizations that meet the business need, such as required services or materials, or those that help in the distribution of goods. Throughout this process, there are several considerations:

- **Protocols.** This is the first step of discovery and negotiation at the protocol and architectural level. It includes Transmission Control Protocol/Internet Protocol (TCP/IP), HyperText Transfer Protocol (HTTP), HTML, Simple Mail Transfer Protocol (SMTP), and so on. It is a complex process because there are many layers, and all must match before the session can be initiated.
- **Documents.** After the session is started, this includes the documents (such as purchase orders or invoices) that are exchanged, as well as the standards they follow.
- **Elements.** After the document session is established, the subsequent layers include individual data elements and interpretations (for example, this can be purchase order date or item quantity).

After the negotiation is completed and the session confirmed, all format and protocol architectures must be in compliance for information exchange to occur. Documents and elements engage in an investigative process that ascertains which protocols are common, and then business is conducted.

As mentioned above, various industry vendors currently are driving four major initiatives for business-to-business

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interoperability. Each initiative has similar ideas with different assumptions. Variations in standards do not foster interconnection, however, which in turn promotes autonomy of information exchange. Figure 2 shows various XML initiatives and summarizes the basic assumptions of each framework.

A Business-to-Business Operational Example

Supply company A must find several distributors for its products. It initiates an automated search for distributors using the eCo framework protocol. The protocol responds with several businesses that meet company A's require-

ments. Next, the automated discovery system engages in dialogs with the possible distributors to find the protocols, business documents, and data elements that the systems mutually support.

The discovery system finds that a distributor and company A both support e-commerce exchange over EDI type Y, version X; documents of the purchase order and invoice types for transactions; and Commerce XML (cXML) for catalog data element definitions. The system also finds that the data elements used in the documents have the same meaning. Thus, protocol, documents, and data elements all match; therefore, e-business can take place.

The discovery system continues searching for other distributors, and it finds another matching distributor that supports e-speak. The system shifts gears and conducts the

XML INITIATIVES AND ASSUMPTIONS				
Frameworks	Discovery Process	Protocols	Document	Elements
BizTalk	No	Content wrapper	Placeholder for other standards' documents	Placeholder for other standards
cXML	No	Proprietary request and response	New proprietary documents	New elements
eCo	Yes. Appropriate business- and technology-focused identification	Existing standards or eCo protocol	Existing standards or eCo documents	Existing standards or eCo data elements
e-speak	Yes. Technology-focused protocol negotiation	Existing standards and e-speak protocol	Placeholder for existing standards	Placeholder for existing standards

Figure 2. XML Initiatives and Assumptions

protocol, document, and data element discovery process using the e-speak protocols.

Yet another distributor matches with HTTP using secure sockets layer (SSL) for security and transport. The document wrapper is BizTalk and the document is cXML Purchase Request; the data elements match.

Company A now has three potential distributors for conducting business, all using different protocols, documents, and data elements—and all established with very little human involvement.

Implications for Your Organization

Be wary of adopting any product that implements its own XML standard vocabulary and syntax across organizations. Several key efforts to facilitate e-commerce and EDI standard consistency are taking place that will reduce your organization's risk in using XML for commerce. The standardization and, therefore, success of this solution will be a major advancement for corporate procurement.

The XML standards as defined by the four major companies and their standardization efforts include:

BizTalk: Microsoft's business-to-business initiative focuses on two broad areas:

- As an envelope to describe XML contents
- To route information and design guidelines for using XML

BizTalk will also incorporate many other protocols.

cXML: Ariba's business-to-business initiative, with the participation of 40 other companies, defines three general areas:

- A simple request/response protocol
- The definition of PO and PO response transactions
- The definitions of catalog data

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cXML is a stand-alone standard and will not incorporate other protocols.

eCo: Sponsored by CommerceNet, with participation from over 30 organizations, this framework has two general areas:

- A discovery process with supporting protocols that support the identification and selection of other organizations
- Supporting descriptions of services, processes, and documents, such as PO and data-element descriptions

eCo also includes documents to incorporate and bring other protocols together to facilitate interoperability.

e-speak: Developed by HP, e-speak deals with the descriptions of resources but not the definition of specific resources. It describes a transaction, but not the contents of the transaction or the format of the data within it. It implements a discovery protocol so that organizations can automatically discover a common means to communicate for electronic commerce. ♦

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