

The B2B Standards War:

When Bruce Ambler, Lucent's senior manager for CIO performance and architecture, talks about standards, he tells people that "standards set you free." In so doing, he turns on its head the traditional reaction to standards as restrictive and lackluster. If there was one lesson big companies learned in the '90s, he says, it was that corporations need one set of interfaces for communications. The good news is that we're approaching this goal. Although the battlefield for business-to-business (B2B) networking standards may seem like a chaotic collection of small skirmishes, the reality is that standards have already begun to converge. Standards are a critical issue because universal connectivity is now possible. There's already a clear direction in the efforts to agree on common formats for exchanging information in B2B transactions.

Connect or Die!

By Bill Harrelson

It's an interesting time in the B2B standards arena. The fact that there are so many active players, both large and small, indicates a change from an early, pioneering stage in Internet communications to a second stage, when companies compete for critical mass. Now you can watch standards shift and coalesce from month to month. Within two years, one will see XML standards reaching critical mass. Other standards for business processes and transport frameworks are also coalescing. The forces driving this rapid convergence are many — the need for a common system is unquestioned.

Standards Drive Productivity

While much of the business world still views standards as limiting and confining, they actually create a stability that boosts productivity. Dr. Tim Thomas, a chief architect at Ford, observes that, "Every introduction of standards has been followed by a significant productivity gain." The reason is obvious: Effort spent on non-productive differentiation becomes available for productive enterprises.

The need for standards always arises when people want to connect and communicate. In the 19th century in the U.S., for example, the National Bureau of Standards was founded to establish standards for the national railroad. Other countries and regions developed similar organizations to ensure that the new technologies of the industrial revolution were systematically standardized. Often governments participated to ensure the open, equal implementation of standards. What's new in this standards activity involves the dynamics of software products and the networked economy it supports. Where in industrial times, many standards could be considered "hardware,"

such as the standard gauge for railroads, today's standards address software, coding formats, and security (see Figure 1).

There are four levels to the communications standards now under discussion for B2B. Note that some standards initiatives focus on only one of the four levels; others span multiple levels. Some are proprietary; some represent neutral industry consortia. The four levels are:

- **Metadata** — the abstract format for representing data. Metadata defines the record structures to be used, the fields those records will contain, and the character set to be used in transmission. EDI and XML are both meta-standards (see Sidebar: "XML: Just Another Three-Letter Acronym for EDI?").
- **Content** — defines the series of tags used in a specific Business Object Document (BOD). Thus, content would define what types of information (or fields) exist in a Purchase Order (PO), including item, vendor name, date of purchase request, and so on. The same is true for definitions of bills of materials, catalogs, and availability. These would be generic definitions of business objects that could be narrowed or refined to suit a particular industry.
- **Transport framework** — defines the "envelope" (also called "header" or "wrapper") that contains message routing instructions. The transport framework is a protocol for sending data from one business to another over the Internet.
- **Business process** — A business process contains several transactions. It dictates, for example, how businesses have agreed to negotiate a PO between them or how a Request for Proposal (RFP) bid process occurs. The Open Applications Group, Inc. (OAGI) standards group is currently defining a set. A business process is sometimes called a trading partner agreement.

Within these areas, and often spanning them, are various industry consortia, independent groups and corporations, all of which are building standards or overseeing the definition of standards:

- **OAGI** is a non-profit consortium composed of many of the major stakeholders in the area of business process software interoperability. OAGI has

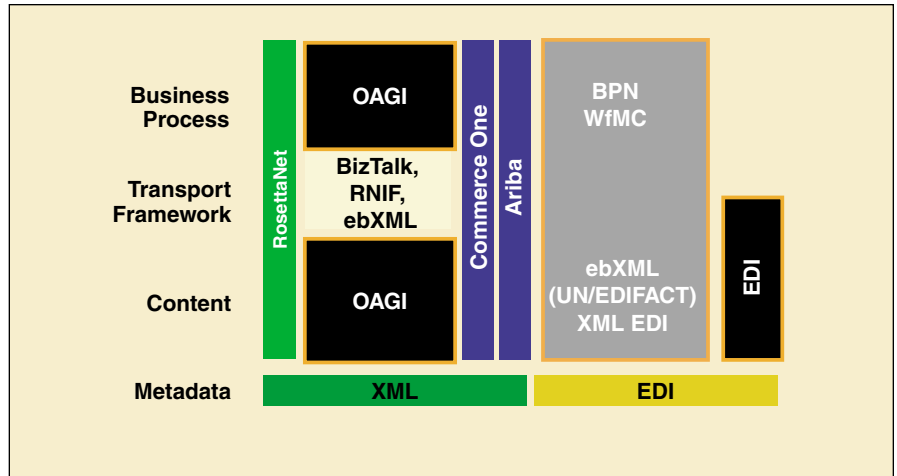


Figure 1 — Standards Relationships Today

assembled a large group of major industrial, telecommunications, and systems software companies to create a group of business processes, based on XML content, that will extend current boundaries — corporate, industrial, geographical, and cultural. They've also formed task forces to help establish XML "gold standards" for major vertical industries. OAGI offers a horizontal model that complements the vertical industries. It provides strong content development and architecture as well as XML leader-

ship. OAGI is the single largest content developer in the XML space.

- **RosettaNet** has focused on developing interoperability standards for the electronics industry, including electronic components and information technology. This group tries to capitalize on the cost savings and productivity gains the Internet offers. This non-profit organization attempts to compensate for the limitations of EDI. While it started out as a fully vertical solution for all four levels of data, it's currently moving to ally

XML: Just Another Three-Letter Acronym for EDI?

One of the most common questions about XML is how it differs from and improves upon EDI. Standards for EDI were formulated more than 20 years ago. They've been widely adopted by a small group of large companies. Mostly large companies have used EDI because it's expensive to implement and maintain.

	EDI	XML
Mode of Exchange	Batched Documents	Real-time Single Documents
Basic Data Delivery	VANs	Internet
Standards Bodies	ANSI/EDIFACT	W3C
Connectivity	One-to-One	One-to-Many
Usage	Declining Slowly	Emerging Rapidly

This table highlights some of the differences between EDI and XML. EDI shares a structural foundation with COBOL, whereas XML is allied with object-oriented programming. So every instance of an EDI connection is a one-to-one connection between organizations that have agreed to communicate using the EDI protocols. XML, on the other, works like an object-oriented language. It has sets of classes, which can be extended without changing the core class. Thus, a PO from one company could differ considerably from that in a defined class. This is why industry standards will generally work with XML. Each industry can define its own extensions to the core class of, for example, a PO. But that core class will remain the same. So, if a company in one industry wants to communicate with a company in a different industry, the core PO remains the same. The extensions, which are industry-specific fields, probably won't matter to a trading partner in another industry.

— B.H.

itself with OAGI for content standards, and with ebXML, itself a part of a United Nations (U.N.) initiative, for transport framework standards. RosettaNet's own transport framework is known as RosettaNet Implementation Framework (RNIF).

- **Biztalk** is a Microsoft initiative for defining the transport framework. Biztalk is already working with OAGI and RosettaNet toward common standards. BizTalk is also an XML repository that makes standardized XML definitions widely available. A significant portion of the content on the XML.org site is provided by OAGI.
- **Commerce One** is a company working on its own proprietary framework (xCBL) for content, framework, and business processes based on XML. Commerce One specializes in complex transactions for lower-volume transactions among organizations that use negotiated agreements on transactions.
- **Ariba** is another company working on a proprietary framework (cXML) across all levels. It specializes in simple transactions for highly fragmented business structures that dynamically transact business. Ariba is harmonizing its transport framework with BizTalk.
- **ebXML** is actually a U.N. initiative working with European EDI groups to formalize a framework that will serve both EDI and XML standards. CEFAC (an associated U.N. organization) covers worldwide policy and technical development in areas of trade facilitation and e-business, and OASIS, a non-profit, international consortium, is dedicated solely to product-independent data and content interchange.
- **WfMC** (Workflow Management Coalition) is part of ebXML and is working on a meta-standard for trading partner agreements. BPM (Business Process Methodology) includes work on OAMAS, which is an OAGI specification.
- The **XMLEDI** group is working on interfaces that accommodate both EDI and XML.

Standards and Networks

The nature of the network business model is such that open standards are a prerequisite. In *Information Rules: A Strategic Guide to the Network Economy*, economists Carl Shapiro and Hal Varian (see Harvard Business School Press, 1999, 197-199) describe the standards

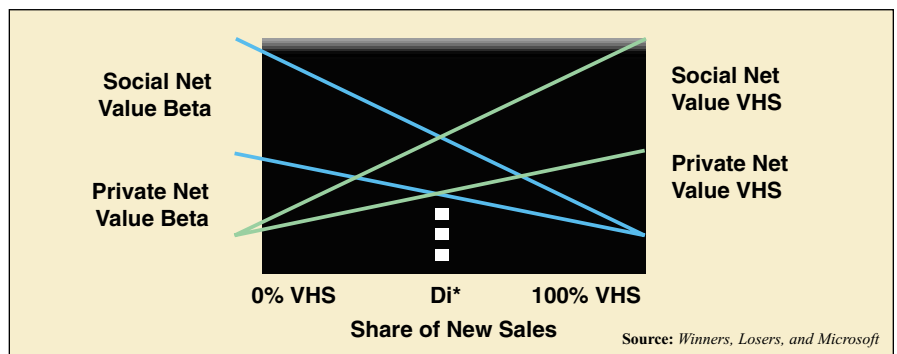


Figure 2 — BetaMax vs. VHS: Autarky and Synchronization Values

requirements for networks this way:

“The failure to open up a technology can spell its demise. To maximize the value of your new technology, you’ll likely need to share that value with other players in the industry. Information technology is comprised of systems and an increase in value if one component necessarily spills over to other components.”

**The smart
path today
is toward
convergence.**

Some companies see the current standards war as an opportunity to become the “next Microsoft.” But these companies are really fighting the previous war. The rush to PC standards had little relation to networks. The smart path today is toward convergence.

Autarky vs. Synchronization

An analysis of the value of a technology in and of itself vs. the value of a technology when synchronized with others makes the relationship between standards and networks quite clear. The term for the value of an object in and of itself (without integration with any other object) is its “autarky” value. For example, the value of a VHS player is low, but

it does have the capacity to record and play back tapes, even if there are not other users with similar machines. A BetaMax player has a larger autarky value than a VHS player because the quality is higher. A VHS machine’s synchronization value, on the other hand, is much higher, since the more people who have machines using the same formatting standards, the more plentiful will be the options for rental, sales, and exchange of tapes. A BetaMax player’s synchronization value is rapidly nearing zero. Some objects, such as facsimile machines and modems, have zero value in and of themselves.

In Figure 2, the chart for VHS vs. Beta formats, the inflection point is where the market reaches equilibrium and users are relatively indifferent to which format is used. On either side of the inflection point, users will have a preference either for the format that the autarky value supports or for the standardized format that creates a community of users. Critical mass for the VHS standard occurs later in the timeline. There, the reinforcing effect of a larger pool of users — attracting even more users to the format — creates the momentum necessary for critical mass. Users perceive that the benefits of switching to a new format — here a larger networked business base — outweigh the costs of making the switch. At the point of critical mass, the synchronization value gains a self-reinforcing momentum.

For an extensive, interesting discussion of standards, autarky, and synchronization, see *Winners, Losers, and Microsoft: Competition and Antitrust in High Technology*, (The Independent Institute, 1999).

Standards and Integration Models

Figure 3 illustrates the timelines for

the synchronization and autarky values of four different types of systems:

- **Standards** — The value of a system of standards, in and of itself, is quite low. Some value resides in the fact that the standard system is a self-contained, internally consistent framework that could be of use. Nonetheless, without connectivity, a set of standards has little value.
- **Net Markets** — Exchanges have some value even without synchronization and automation. Organizations can manually conduct business through transactions that probably must be manipulated and translated several times to complete a business process between two organizations with differing standards. The value of an exchange grows exponentially as networked users join the trading community.
- **Application Service Providers (ASPs)** — ASPs can offer even more value than an exchange without the benefit of a network. An ASP can offer its user base great value without necessarily being synchronized with others.
- **Proprietary applications** — Back-office systems have even more value in and of themselves since entire companies can communicate within the organization to transact business efficiently. While synchronized connections with the outside world certainly extend a company's richness and reach, it may take longer for a company to see the value in being able to communicate with others automatically and in standard formats.

The graph in Figure 3 is simplified; the autarky value for various models may diverge from those shown. Nonetheless, it's clear that the order is correct. The inflection points for each of these business models reveal interesting progressions. Equilibrium between autarky and synchronization values for ASPs is likely to occur later than for Net markets and later still for proprietary applications. It seems that exchanges, and their participants within trading communities, will lead the charge in the formulation and convergence of standards.

Critical mass for these business models occurs when users perceive the value in the standardized format in spite of any costs they might incur to switch. The challenge isn't really technical but

strategic. Companies have communicated for years through other means. Large companies have used EDI successfully with their major trading partners. But now, companies need broadly adopted

**"Companies that
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standards to enable B2B connections over the Internet.

Now Is the Time

Figure 3 also indicates roughly where on the timeline companies stand today. Of course, individual companies will have different rates of standardization. The Net markets have passed the inflection point (where the autarky value is equal to the synchronization value) and are reaching critical mass. The value of the networked, synchronized Net market is growing at a faster rate. The more users, the larger the network. The larger the network, the greater the value. The reinforcing effect of this cycle may temporarily create a stable predominance of certain standards and formats.

Early Adopters Have Their Day

In this rapidly evolving world of network standards, the early adopters may have their day. Philip Evans and Thomas Wurster addressed this situation in their article, *Blown to Bits: How the New Economics of Information Transforms Strategy* (see Harvard Business School Press, 2000, 191). They noted that it's easy to know the need and value of standards, but it's impossible to predict



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exactly which flavor of standard will actually emerge in the B2B world or how it will emerge.

As Lucent's Bruce Ambler points out, "The market is a lousy engineer, but it's the only one we've got."

Adopting a standard ahead of the pack can be a risky process. On the other hand, waiting until the standards are established can spell doom for a company.

A recent AMR report on Net markets said that companies that do not enter into Internet trading will wither on the vine. Indeed, the peril of standing on the sidelines may well outweigh the risks of forging ahead without a clear sense of where the path will end:

"Once you've achieved standardization to one set of protocols, it's much easier to switch to another," Thomasma points out. "The large effort for all companies — but especially for those with mixed legacy systems — is to change at all. If they've streamlined and simplified their systems when standardizing in the first place, then switching to another standard is relatively simple and straightforward. Once there are popular standards, there'll always be companies that create an efficient way to migrate from one standard to another."

Looking Ahead

The impossibility of predicting the future has seldom stopped technologists from trying to do it anyway. So here are some predictions:

- ebXML will garner considerable support and will be the de facto standard for the transport framework definition, as well as a meta-standard for trading partner agreements.
- ebXML will seek to harmonize content definitions with other standards efforts, notably EDI (X.12 and EDIFACT), OAGI, and RosettaNet.
- OAGI will continue to aggressively develop horizontal content and will continue its early beginnings of providing vertical specialization of that horizontal content. It will continue its leadership in content creation. The adoption of OAGI by major Internet players will reach critical mass late in 2000, driven by major aerospace and automotive exchanges and their 100,000 suppliers adopting this standard. (See Figure 4)
- OAGI will adopt ebXML transport frameworks and make BizTalk an alternative. (It already supports both

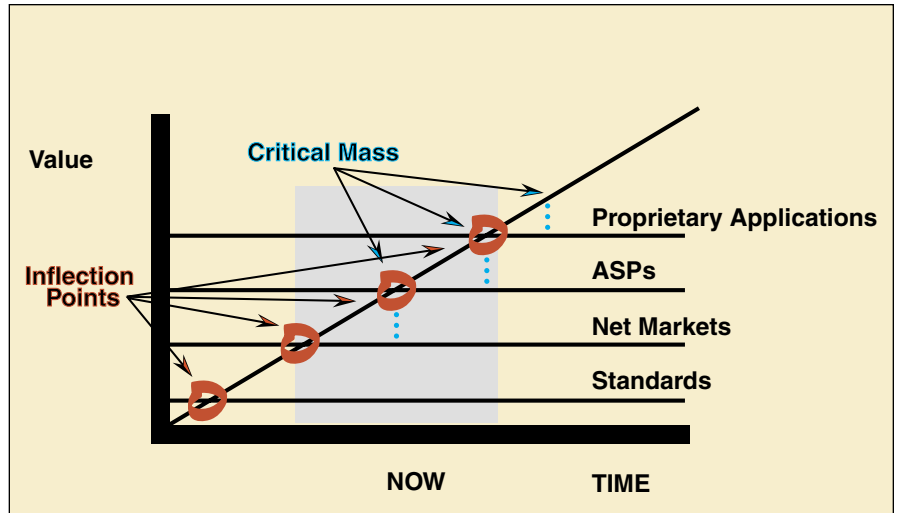


Figure 3 — B2B Standards and Business Models: Autarky vs. Synchronization

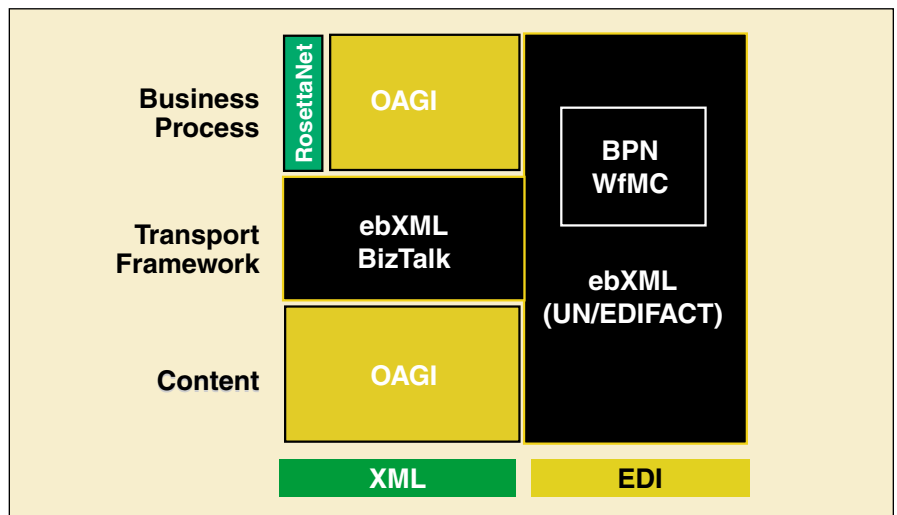


Figure 4 — Standards Relationships Tomorrow

the RosettaNet and BizTalk transport frameworks.)

- RosettaNet will concentrate on process definitions for supply-chain trading partners, which will be consistent with their expressed goals, charter, and membership. They'll harmonize content standards with OAGI's; their framework will migrate to ebXML (both of these frameworks are based on OBI).
- Proprietary frameworks will begin to migrate to open standards. This will not be difficult because the distance between them is small to begin with. New features will be added based on an existing body of work, rather than attempting to create something new for no reason.

In short, convergence will happen — probably within the next year. These bets are beginning to look safe.

About the Author



As chief technology officer at Canopy International, Bill Harrelson has been part of the development of the firm's B2B integration architectures, infrastructure, methodologies, and component technology strategy and delivery. He has been actively developing innovations in the areas of distributed database research, development methodologies, infrastructure standards and B2B standards and architectures. Mr. Harrelson also serves as the vice-chairman of marketing for the largest XML content standards body, the Open Applications Group and sits on several technology advisory boards for infrastructure software providers. Voice: 617-796-5444; e-Mail: bill.harrelson@canopyint.com; Web-site: www.canopyint.com.