

INTRODUCING XML/EDI FRAMEWORKS

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BACKGROUND

XML (eXtensible Markup Language) is providing Internet developers with new tools for implementing E-Commerce and EDI solutions. In 1996 the World Wide Web Consortium (W3C) joined with SGML experts to form an SGML Working Group which strategically pruned SGML into a refined subset now known as XML. XML was formally introduced in 1997.

Not only is XML supported by the leading Internet Web browsers, but Byte Magazine, January 1998, included XML as one of the top twenty-five technologies to watch this year. The leading web browser products already support XML in their latest releases. Additionally Microsoft has committed that Microsoft Office Suite 98 release will be able to read and create XML documents directly, as easily as they currently read and create HTML documents. WordPerfect word processor already supports SGML formats, and so XML is a natural step in its development too. XML as a tool goes beyond simple HTML style document mark-up and allows the creation of custom tokens and document structures.

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Essentially this makes XML infinitely extensible, while HTML is a closed and limited technology.

This article focuses on the fusion of XML technologies with EDI. Both are essentially data and meta-data encapsulated in tokenized formats and structures. Therefore existing EDI mechanisms can be expressed in XML syntax, and new more flexible EDI methods can thereby be cre-

ated. This simple realization has led to several initiatives broadly termed XML/EDI, and more specifically the XML/EDI Group was founded via the Internet in July, 1997 to specifically foster and advance the open and broad based use of XML/EDI for next generation E-business implementations.

The vision for XML/EDI is to allow organizations to deploy smarter, cheaper and more maintainable systems to a global audience. XML/EDI is thus equally accessible to small business as to large corporations.

This document discusses primarily the business reasons for selecting XML/EDI. It also provides a technology overview to allow corporate managers to understand what XML/EDI can deliver and how it can be deployed.

THE BUSINESS ANALYSIS

Setting up traditional EDI is an expensive and time consuming manual process as trading partners attempt to synchronize their internal systems with the external systems of their partners. Worse, some large companies, such as the major car manufacturers have potentially three hundred thousand trading partners in the USA alone.

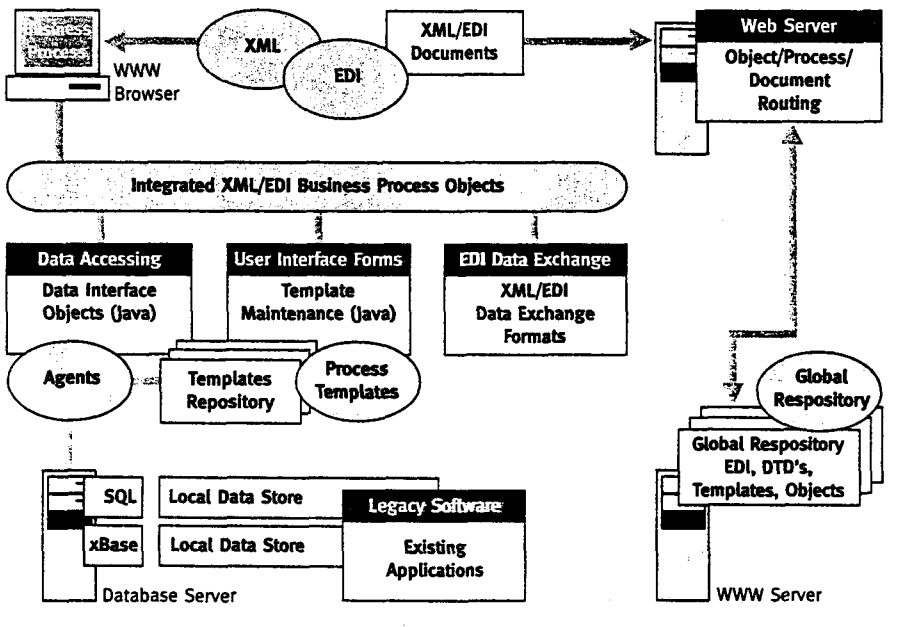


Figure 1
An integrated XML/EDI internet based system.

XML/EDI solves this impasse by allowing each trading partner to quickly synchronize their systems by exchanging not just EDI data, but also process control templates as well. Thus not only is data exchanged but also the enabling underlying processing information.

Additionally the process control templates are supported by the use of software agents (typically Java and ActiveX components) and internet based Global Reference Repositories that allow the required processes to be both directed and centrally coordinated (figure 1). This means that large companies can provide a foundation that their smaller trading partners can easily download and re-use, or simply adapt for their local needs.

Extended rule based business processes are also now possible, going beyond traditional process flow forms, and including dynamic ad hoc systems that adapt. This is the model needed to create full Electronic Enterprises where documents and business information flows and is exchanged easily.

Other business models are also enabled. The use of HTML on the Web has already allowed product catalogues to be integrated into the sales order process. Better

yet with XML markup creating objects and meta-data new uses for catalogues, that allow customers to request information based on criteria and rules can be setup. Also XML documents include Web style content such as graphics and multimedia, not just bare text (figure 2).

However returning to the underlying business parameters rather than technologies themselves, history shows that in the past traditional EDI failed to create a broad based acceptance for a number of reasons. To deliver a next generation global EDI solution the following capabilities must be addressed as the "Business Top Ten" requirements list:

1. Reduce cost of doing business ✓
2. Reduce cost of entry into EDI ✓
3. Provide an easy to use tool-set ✓
4. Improve data integrity and accessibility ✓
5. Provide appropriate security and control ✓
6. Extendable and Controllable Technology ✓
7. Integrates with Today's systems ✓
8. Utilizes Open Standards ✓
9. Provides successor to X12/EDIFACT ✓
10. Globally deployable ✓

WHY XML/EDI?

As we have already seen XML is a new Web specification and standard that both Netscape and Microsoft have endorsed and are including in their latest browser products. XML allows programmers greater freedom in sending information and data across the Web. Currently Web pages use HTML tokens to describe content, XML (Extended Markup Language) uses the same token based method, but allows dynamic tokens and object structures as well.

EDI (Electronic Data Interchange) has traditionally used unique segment identifiers like tokens to separate and identify data items within messages. So replacing those same segments with Web tokens allows XML to express EDI and carry EDI via Web delivery methods. This moves EDI from the arcane, obtuse and static into the dynamic mainstream of computing. From the pitifully inadequate 10,000 companies using current EDI in the US, to millions of desktops and companies instead. Independent estimates by companies such as Piper Jaffray Inc's "Electronic Commerce Report", put the use of Electronic Commerce as a \$228 billion industry within five years <http://www8.zdnet.com/pcweek/news/0804/07aecom.html>

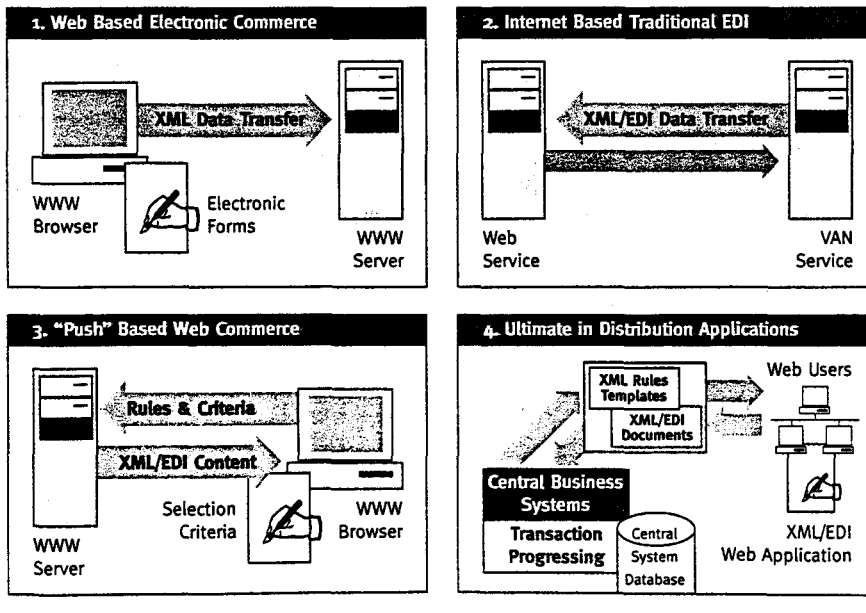


Figure 2
 Capabilities for XML/EDI based applications.

THE POWER OF FIVE

Simply redefining the message format to make it Web deployable is not enough of itself. Old style EDI is captive to its own fixed structures and inflexibility. To save XML/EDI suffering this same fate, the XML/EDI Guidelines proposed by the XML/EDI Group adds three additional key components:

- ◆ process Templates,
- ◆ software Agents,
- ◆ and Global Entity Repositories.

These three additional components transform old EDI into XML/EDI that allows full dynamic Electronic Commerce between business partners and that avoids the mistakes of the past. Each component adds unique tools that leverage the other pieces. In the past EDI was very static, what XML/EDI provides is an exciting dynamic process that can be infinitely extended. We now look at each of the five technology components in turn to give you an overview.

XML itself provides the foundation. The Web was born on the abilities of the HTML language, itself a very limited subset of the original and highly complex SGML document syntax. Now XML has been created that sits between the two, not as complex as SGML, but vastly more capable than HTML. XML tokens and frameworks are the syntax that transports the

other components across the network. XML tokens replace or supplement existing EDI segment identifiers. XML also brings with it all the rich capabilities and transport layers of the Web and the Internet in general.

EDI is the grandfather of the current electronic commerce. The ability to express data in a simple format and send it to someone else so they can interpret the information they have just received. XML/EDI provides 100% backward compatibility to existing EDI transactions, while moving EDI forward to the next generation. This means we do not have to discard the investment in existing EDI systems and knowledge.

Process Templates, these provide the glue that holds the whole XML/EDI method together. Without templates you cannot express in the XML syntax alone all the details of the work that needs to be done. Templates are globally referenced or travel along inside the XML as a special section and set of tokens, and can be easily read and interpreted. They resemble traditional process control language syntax in layout and content and they are supplemented by what XML calls Document Type Definitions (DTD's). DTDs enable transaction interoperability by defining the structure and content. Templates enable processing (which may include presentation) of transactions. DTD's let two organizations understand each other's data. Process templates define what happens to that data.

Software Agents, both interpret the Process Templates to perform the work needed, and also interact with the EDI transaction data definitions and the users business applications to create new templates for each new specific task. Agents can also look up and attach the right template for existing jobs by accessing the Global Repository. They also can reference DTD's to determine display characteristics for forms. This is where Java and ActiveX fit in. Right now they provide the best medium for creating Agents, and of course, XML struc-

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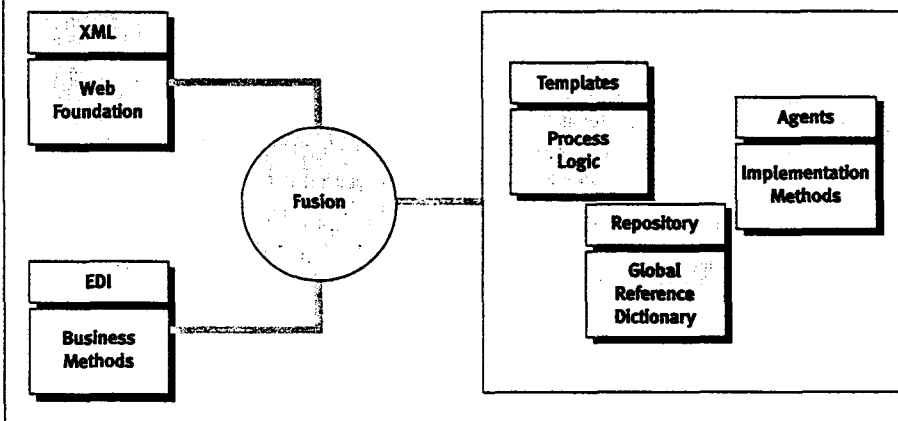


Figure 3 The components of XML/EDI.

tures containing these pieces can be referenced or transported to wherever they are required.

Global Internet Repositories are already in use by hybrids of traditional EDI systems such as the BSI BEACON system. This uses the BEACON dictionary that allows users to manually look up the meaning and definition of EDI elements. The Global Internet Repository concept takes this to the next level, and provides automatic lookups rather like the more advanced Internet search engines now do. This component provides the semantic foundation for global business transactions and the underpinning that the Software Agents need to correctly cross-reference entities. (While repositories will include existing traditional EDI code and element dictionaries, these will be supplemented by adding DTD's and Process templates to the content as well).

Combining the five components of XML/EDI together provides a system that delivers information, not just data, and along with the information the processing logic that is required.

Thus XML/EDI also defines a standard for encoding the presentation characteristics, structure, and behaviors of data that supports business transactions (catalogs, order forms, and healthcare claims). This facilitates the exchange of transaction-critical information, and, therefore, the automatic-execution of document-based transactions.

The essential idea is to add enough intelligence to the documents so that they (and the document-centric tools that handle them) become the framework for electronic commerce.

SUMMARY

Inventing an entirely new way of developing business solutions, XML/EDI builds from the strengths of accumulated knowl-

KEYWORDS

ActiveX components.

Microsoft designation for executable objects written in any variety of programming languages that conform to a Microsoft systems specification that allows them to be distributed and executed directly via the Windows operating system model.

Browser

Running on virtually any type of computer hardware connected to the Internet by TCP/IP, this special piece of desktop software allows users to view pages of WWW content and to accomplish many other Internet tasks, such as E-Mail, transfer of bulky data files, and use of Internet News Groups. Netscape (Navigator) and Microsoft (Internet Explorer) share predominant portions of the browser market.

SGML

Standard Generalized Markup Language. After ten years of development, this complex and comprehensive metalanguage for defining markup languages represents the current international standard for document composition.

WWW

World Wide Web. Widely used facility of the Internet which allows browser users to Link between related items of formatted text and images stored on geographically remote computers.

XML

Extensible Markup Language. Subset of SGML. Customized tokens define WWW pages allowing greater addressability of data and processes than previously possible with HTML.

edge from the past two decades. XML itself provides the means for people to clearly express data and process as information objects, and to embed and link software objects together. XML also facilitates existing search and locate mechanisms so that less ambiguous results are available.

XML/EDI is deployable to anyone with a Web Browser and an Internet connection. It will allow them simple and cheap access to what were hitherto expensive business tools. XML/EDI is the technology for businesses to deploy their next generation systems with. It will replace existing simple HTML based Web Commerce, it will replace legacy business systems and it is backward compatible and easy to integrate with old in place applications.

XML products are being delivered by Microsoft, Netscape and independent vendors. This provides a solid industry foundation. New extended business solutions are now possible using XML/EDI technology, this will create another level of business opportunities. XML/EDI is emerging as the brightest prospect for future global EDI standards.

Clearly such bold and difficult objectives will not be reached overnight. The XML/EDI Group is already facilitating pilot efforts making initial use of XML for EDI in Intranet environments. The work also includes active involvement with existing standards bodies such as X12 in the USA, EDIFACT in Europe and Internet standards bodies.

It is apparent that the tools are at hand to build XML/EDI systems and that XML innovators are already hard at work. The sum total of XML capabilities heralds a terrific impact on electronic commerce.

More information and assistance can be found by contacting the XML/EDI Group at: <http://www.xmledi.net/>.