



BUSINESS-TO-BUSINESS PROCESS INTEGRATION TO SUPPORT
COLLABORATIVE COMMERCE

Automating Collaboration with
J.D. Edwards' Integration System

Collaborative Commerce Strategy

What Is a Collaborative Commerce Strategy?

The Internet economy is driving companies worldwide to come up with an effective strategy to exploit the Internet for collaborative commerce. Organizations are seeking answers to such questions as:

- How can the Internet be used to streamline processes that are shared with business partners?
- What opportunities does the Web provide to capture new markets and define unique business value?

In an attempt to take advantage of the Internet, many companies rush to Web-enable their customer-facing applications. Their efforts vary from placing marketing and pricing information on the Internet to providing online technical support to creating sophisticated storefronts. Although these initiatives tap a fraction of the full power of the Internet, they can significantly increase revenue by allowing companies to deal directly with end consumers. Channel middlemen are eliminated and new, global sales channels can be opened with minimal up-front cost or effort.

Another limited collaborative or “c-commerce” strategy involves migrating business communications to the Internet. Where companies once sent business documents via fax, mail, or over EDI value-added networks, they can now send documents cheaply and efficiently over the Internet. Today, it’s commonplace to receive a purchase order or invoice via e-mail as companies look to lower business costs by moving EDI transmission to the Web.

However, an effective c-commerce strategy should not be restricted to browser front ends or low-cost communication mechanisms. By themselves, storefronts and procurement portals do little to help individual organizations address the strategic questions of *how much* to produce to meet demand and *when* to order materials to minimize inventory and speed delivery. The successful strategy focuses on shared *processes* among suppliers, customers, and business partners. It harnesses the power of the Internet to *automate* business-to-business (B2B) collaboration, so entire supply chains can perform at optimum efficiency.

At this level, businesses work together to make product, ship it, account for it, and serve customers more efficiently. They don’t just share data and information. Intelligence is linked to transactions, so that placing an order can trigger events that span organizations — from checking parts availability at a supplier to updating the production schedule with a contract manufacturer to identifying trends in a customer’s buying patterns to modifying forecasts.

With pervasive collaboration, organizations realize the greatest value potential because efficiencies and innovations flow through multiple businesses. Instead of simply optimizing individual operations, enterprises co-orchestrate efficient, effective value chain processes.

Such pervasive collaboration implies the integration of business applications and data with the Internet and the systems of trading partners. True end-to-end process integration can offer increased efficiency in every business process, including procurement, logistics, manufacturing, customer service, development and engi-

neering processes — virtually any business dialog between two entities. Improved efficiency in these core business processes leads to faster cycle times, reduced overhead, more competitive offerings, and increased visibility into business drivers. Companies that can implement this c-commerce vision are saving tens of millions of dollars per year that directly contribute to bottom-line results.

Unfortunately, very few companies have made any attempt to integrate a meaningful business application with their Internet front end. When Web orders are received, there is often no automated connection from the Web front end to the back-end order entry and fulfillment management systems. Automating the supply chain process is therefore one of the primary areas industry-leading companies are looking to apply process automation. This implies integrating business applications, which manage pipeline and manufacturing processes. The first step in effective process integration may be to integrate disparate business applications internally and optimize operations within the enterprise before linking processes with trading partners.

When business process integration is ultimately achieved across an entire supply chain, or between a manufacturer and its distribution channels, the financial return dwarfs the gains realized by setting up disjointed Web front ends. The difference between the two approaches can mean taking a leadership position in the industry due to significant competitive advantage. Only when enterprise business applications and processes are aligned with Web applications can a company truly consider itself to have a competitive e-business strategy.

Challenges to Implementing a C-Commerce Strategy

Unfortunately, there are numerous challenges to implementing an effective c-commerce strategy. Many are largely technical; a vast majority are not. Some of the challenges that companies may need to overcome include:

- Lack of in-house skills to implement e-business solutions
- Limited trust in trading partner relationships
- Poor understanding of existing processes
- Inability to articulate and automate existing processes
- Cultural obstacles, such as internal organization, lethargy, and indecision
- Legacy software systems that integrate poorly and are expensive to extend

Eventually, external factors drive companies to overcome the non-technical problems. A competitor surges ahead with an innovative e-business solution. Or a major trading partner dictates that a continued relationship hinges on effective, electronic collaboration. Fortunately, the technical challenges are often the easiest to overcome, once there is sufficient motivation and the business processes are understood.

The first technical challenge that a c-commerce solution must address to support end-to-end process integration is the heterogeneity of diverse systems across a trading community. There are countless business applications, data formats, and points of integration that increase process integration complexity exponentially.

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The second technical challenge is the connectivity between businesses, or the communication and messaging infrastructure that has to be designed for a mission-critical environment. This infrastructure must be scalable to large numbers of transactions and trading partners, as well as robust enough to integrate with the core business applications.

The third major technical challenge is representing, implementing, and tracking the automated workflows and processes that are established between the trading partners. There may be hard-to-quantify business intelligence that drives some of these processes. And, there may be specific processes unique to individual trading partners that have to be accommodated. There is almost certainly going to be a wide range of process steps that have to be understood and represented, not only within an organization, but also communicated to trading partners as companies “open up” their processes to optimize the supply chain.

An effective c-commerce solution must address these fundamental technical challenges — interoperability, communication, and process management — while delivering a secure, scalable, and reliable solution suitable for running a company’s most critical core business processes.

The Current State of B2B Communication

C-commerce is not something new. Since the advent of EDI in the late 1960s, companies have been moving business information and documents electronically. Currently, EDI still accounts for the bulk of B2B transactions and has proved to be very reliable and capable for specific processes in a wide range of industries, including automotive, grocery, and retail.

However, the initial deployment costs and ongoing network charges for EDI are comparatively high. As a result businesses that use EDI are combining the structure and integrity of their existing infrastructure with the Internet in order to take advantage of a more cost-effective network.

The Internet has also proliferated the use of e-mail. The problem with EDI and e-mail is that they do very little to improve and automate business processes to effect real business change. While EDI is able to automate many fundamental business transactions, such as purchase orders and invoices, the technology is very message centric. Electronic messaging and transaction transmission is insufficient. The real benefits accrue with the ability to automate the more complicated business “dialogs” or process flows.

To add intelligence and automation to business processes, companies began deploying enterprise resource planning (ERP) software. These solutions significantly improve internal efficiencies by integrating manufacturing, distribution, and financial data and workflows. However, ERP systems fall short as the Internet redefines the end points of business processes. New initiatives like advanced planning, customer relationship management, and e-procurement promise huge returns by extending the focus of the enterprise beyond the four walls. As a result, many organizations are acquiring a growing list of pre-packaged, point solutions designed to fulfill specific e-commerce needs. But, to achieve the promised benefits, they must be integrated with back-end systems.

The need for interoperability among the growing number of enterprise applications gave rise to enterprise application integration (EAI) solutions. These products provide an internal messaging system that connects applications together so they can share information. The messages are often automatically generated by defined process workflows or event conditions.

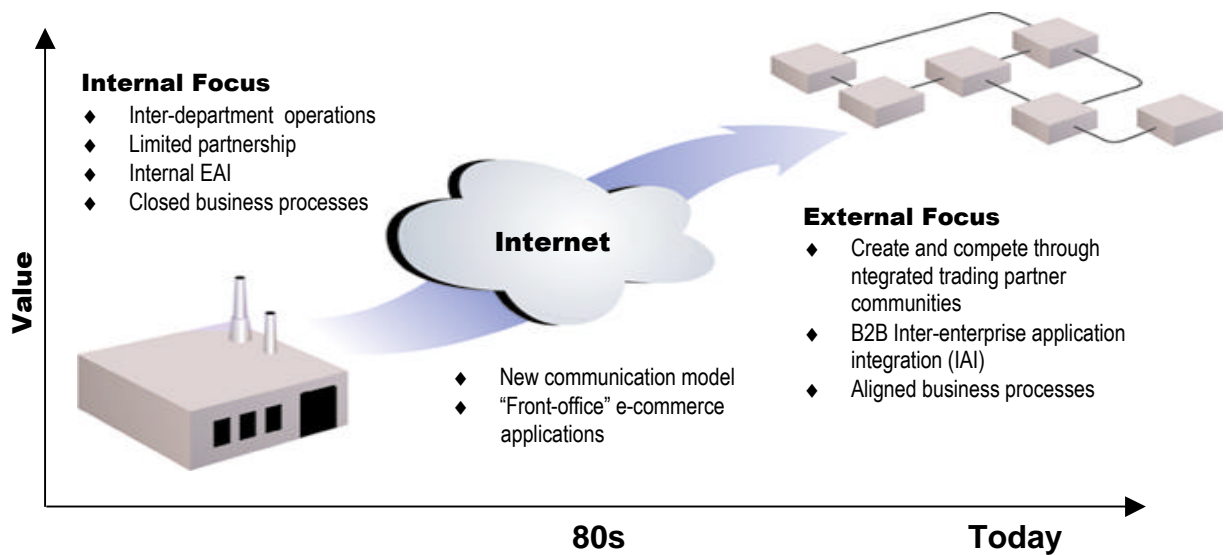


Figure 1: The Evolution of ERP and EAI to B2B Process Integration

The next wave of business communication centers on cross-enterprise application integration, collaborative workflows, and sophisticated business process dialogs. Many of the early EAI technologies have been found to have limited success across company boundaries. While one company can decide to adopt a proprietary messaging technology to integrate its applications internally, it is unreasonable to expect trading partners to commit to identical messaging solutions, particularly if integrating with multiple partners means adopting multiple infrastructures.

By the late 1990s, extensible markup language (XML) emerged to address many of these cross-enterprise application integration issues. XML was designed to be an application-independent way of representing organized or structured data. It has now been nearly universally adopted as a common, intermediate representation language for sending data, application information, or structured documents like EDI messages over the Internet.

XML promises to revolutionize Internet applications much the same way that Java™ did in the mid-1990s. Whereas Java is a way of making applications platform independent — a boon to deploying distributed Web applications — XML gives users a way to represent their data in an application-independent way. This promises to unite business users working with increasingly sophisticated information, no matter what environment they happen to be using.

B2B Process Integration

XML and Java are even more ideally suited as complementary technologies than is apparent at first glance. Both are object oriented. This makes it very easy to write component-based software that can operate on XML data objects, essentially automating the handling of information sent in XML.

Both Java and XML can be extended to suit virtually any environment and application, and can easily integrate with any external system. Increasingly, developers are taking advantage of the flexibility of XML to communicate more than just business data. They are using it to describe workflows, process state information, and collaborative business processes. Sharing this level of information between companies was simply not possible with earlier technologies like EDI or EAI.

The Emerging Standards for XML B2B Communication

While XML is the ideal conduit for sharing business and workflow information, it is still a language in which a business vocabulary needs to be defined between trading partners. For XML messages to be interpreted by other companies, both partners must agree on a common XML-based B2B standard that will define document formats, allowable information, and process descriptions. There are a few such standards that are specific to industry groups.

Adherence to a common standard is not always necessary, but it can increase the number of trading partners with which a company can easily integrate. And it may help define the base process definitions that will be created between companies. A sampling of the important XML protocols or standards is described below:

RosettaNet (www.rosettanet.org) – A B2B, process-oriented standard that arose in the information technology (IT) and electronic component (EC) industries to manage supply chain and distribution issues. RosettaNet defines high-level business processes, such as a new product introduction or inventory management, and breaks them up into specific process flows called Partner Interface Processes (PIPs), which are exchanged and managed between the trading partners. Compared with other XML standards, the RosettaNet community has done an excellent job of creating a complete standard by defining standard processes and an implementation framework in which transactions are exchanged. Other industries may well look to RosettaNet and either extend its focus or use it as a model for success.

BizTalk (www.biztalk.org) – BizTalk is an industry initiative started by Microsoft and supported by a wide range of organizations, from technology vendors like SAP and CommerceOne to technology users like Boeing and BP/Amoco. BizTalk is not a standards body. Instead, it is a community of standards users, with the goal of driving the rapid, consistent adoption of XML to enable electronic commerce and application integration. This community is defining the BizTalk Framework™, a set of guidelines for how to publish schemas in XML and how to use XML messages to easily integrate software programs in order to build rich new solutions.

XML-EDI Group (www.xmledi.org) – This project provides a combination of XML and EDI — called XML/EDI — that offers a complete framework of different tech-

nologies. The goal is to create a format that is usable by applications as well as humans (XML, EDI, Templates, Agents, Repository).

[ebXML](http://www.ebxml.org) (www.ebxml.org) – This is a joint project of the United Nations body for Trade Facilitation and Electronic Business and the Organization for the Advancement of Structured Information Standards (OASIS) to develop a framework for using XML to exchange business data.

The J.D. Edwards Solution for B2B Process Integration

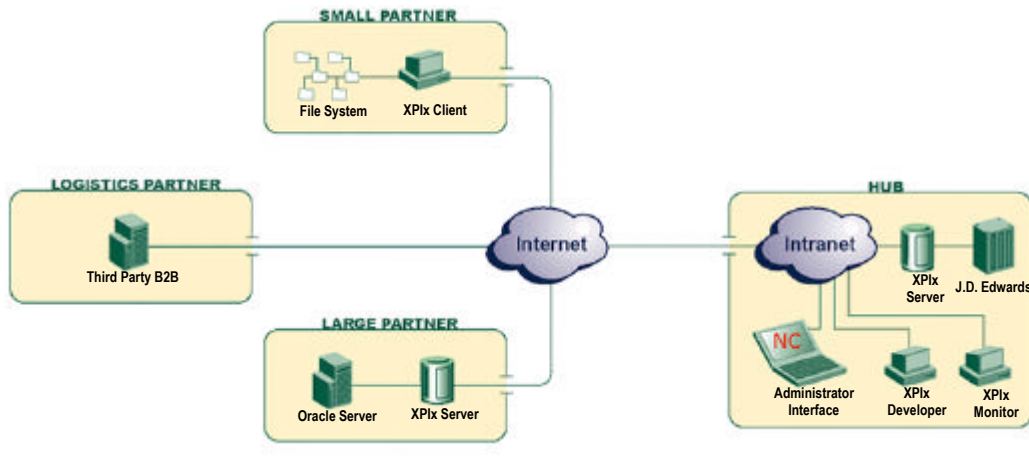
The J.D. Edwards eXtended B2B Process Integration (XPIx) system is one of the first B2B integration solutions that automates complex, shared business processes among enterprises. It delivers a superior XML-based B2B integration server that provides:

- A robust, secure, scalable communication and B2B messaging system
- An extensible process management and workflow engine
- A set of flexible adapters to integrate with a wide range of business applications and data
- Process modeling and analysis tools to optimize B2B processes
- Trading partner management tools to quickly integrate with new partners

J.D. Edwards XPIx combines a complete set of application adapters, a robust XML messaging and communication infrastructure, and a powerful workflow and process management engine to create collaborative workflows between organizations, as well as automate cross-enterprise business transactions.

J.D. Edwards, however, does not lock users into a particular B2B communication model. XPIx is designed to be a company's comprehensive interoperability solution, enabling process integration with both XML-capable partners and EDI-oriented partners. The XPIx system creates a single hub within an organization for all types of transactions and workflows. Other solutions require an all-or-nothing approach to XML or other process integration models, limiting trading partner integration.

J.D. Edwards XPIx supports all major B2B industry standards, such as RosettaNet, the BizTalk Framework, commerce XML (cXML), CommerceNet's eCo, and major EDI standards in XML, so it can communicate with any other open B2B XML solution. Common or proprietary software is never needed at both ends.



The J.D. Edwards XPlx system comprises a server, clients, and a developer suite. The XPlx server orchestrates business processes with a multitude of suppliers running the lightweight XPlx client or other B2B/EDI software. Electronic documents are routed to each trading partner's site for approval or notification, or to update business data in the partner's business system. The J.D. Edwards XPlx Developer suite converts business documents and data into XML for transacting with business partners.

Figure 2: The J.D. Edwards XPlx system unifies business processes across an entire trading community using a range of B2B communication solutions.

XPlx is a 100% Java application, designed for extensibility, scalability, fault-tolerance, and mission-critical failover in a high-volume B2B transaction environment. These benefits translate into a more tightly integrated and automated value chain, dramatically improving efficiency and reducing operating costs in vital business functions.

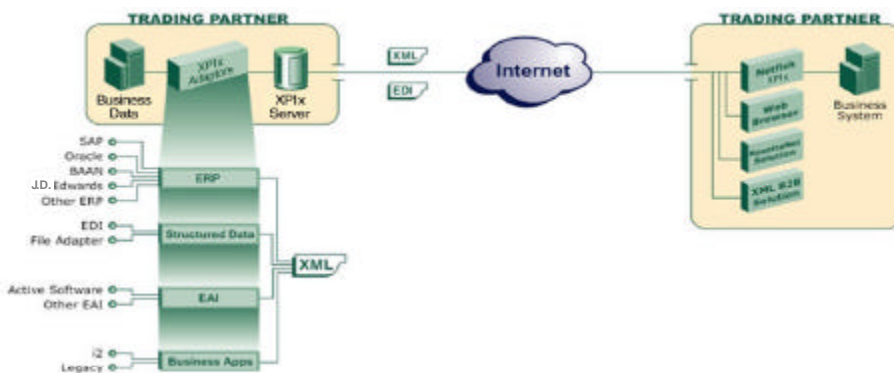


Figure 3: The J.D. Edwards XPlx Developer suite integrates with internal business applications and data to generate XML business transactions.

Case Study: Process Improvements for Strategic Procurement

The following case study is a hypothetical, but representative, example of how a company can more tightly integrate its business processes and applications with those of its suppliers and extended trading community.

ACME Inc. produces high-speed networking add-in cards for desktop workstations and servers. Due to the large number of distributors, OEMs, and international resellers, the company's production schedules can vary widely from month to month. Two years ago, it moved its manufacturing data and production schedules to an ERP system. ACME now has rapid access to inventory levels, production schedules, and product bills of material. Initially there were problems integrating the manufacturing data with the order entry system, which had to be converted from an existing sales database. The issue was resolved by integrating the applications through adapters provided by an EAI vendor and a message broker that coordinates data between the two systems.

When incoming orders signal a production ramp up in order to meet demand, ACME has to go through an extensive procurement process to bring in the components required for assembly of its product. Material forecast reports are printed by purchasing agents, who check prices with authorized vendors. Purchase orders for the required amount of each component are issued via e-mail based on Web forms set up by ACME and accessible over the Web by its suppliers. For a manufacturing run of 10,000 boards, the material costs can vary from \$650,000 to \$715,000.

ACME is looking to improve its procurement process and automate nearly all of the labor-intensive aspects of its business communication. It is hoping to eliminate the need to re-key inventory information into Web forms. And the company is looking for a way to shorten turn-around times by automating purchase order transactions, as well as allowing suppliers access to delivery schedules and cost information. Because ACME purchases components from over 1,500 suppliers, each with its own inventory and production applications, it has been difficult to coordinate information flow and integration.

ACME turned to J.D. Edwards to replace the B2B communication system based around Web forms with an XML messaging and workflow system. XPIx adapters seamlessly connect to the ACME material planning system and can trigger a workflow process when alerted to incoming sales orders. Part of the process is to determine what quantity of each component needs to be ordered, and to automatically generate quote messages to request latest pricing information.

ACME has provided J.D. Edwards XPIx client software to each of its suppliers. Now, when they receive requests for quotes, a workflow process immediately extracts the appropriate information from the supplier's price catalog and sends it back to ACME. XPIx application adapters provided to the supplier integrate the ACME XML messages with the supplier's price catalog so no human processing costs or delays are involved. Pricing information is generally collected and aggregated within a few hours, allowing purchase orders to be generated within a day.

The purchase order process now consists of XML messages being delivered by ACME to mailboxes in the XPIx Client at the supplier. Each purchase order is

Case Study

automatically extracted, compared with earlier pricing information provided to ACME, and verified for consistency. An acknowledgement is sent to ACME within a few seconds and an advance ship notice is generated while the supplier's inventory system is decremented in anticipation of delivery. Supplier turnaround of purchase orders takes minutes rather than days. It has become a "lights-out" operation, even handling orders on weekends and holidays.

The cost of generating a purchase order by ACME has gone down from roughly \$5 via a Web form to under \$.10 via an automated XML message. The entire procurement process has dropped from typically 10 days to less than a day, improving accuracy of forecasts and days cash outstanding. With shorter cycle times, less safety stock is required and, consequently, there is less scrap material at the end of each quarter. ACME is also getting better prices from its suppliers by helping to automate their operations.

Altogether, ACME saves over \$8 million a year in production and material costs. The key to the ACME installation is coordinating business processes with its supply chain, by integrating the J.D. Edwards XPlx messaging and communication infrastructure with its own internal material planning systems. This automates the quote and procurement process by moving the data between companies and applications in XML. ACME avoids re-keying information and automates shared procurement processes with suppliers through agreed-upon workflow procedures.

Conclusion

Companies seeking to improve efficiency and profitability will increasingly use B2B integration to work more closely with trading partners. The widespread adoption of XML as a common data language is giving B2B integration the critical mass it needs for rapid growth. B2B standards built on XML will accelerate this adoption and tightly integrate companies within specific industries and around common well-defined business processes.

J.D. Edwards recognizes this next generation in B2B process integration and has built a comprehensive system designed for all of a company's C-commerce needs. XPlx is a single system that includes the messaging communication infrastructure and the business data integration components, as well as the workflow and process management elements. And since XPlx supports all forms of electronic communication, including EDI and major XML standards, companies will only need one system to talk with all of their trading partners, with only one point of integration to their enterprise applications.



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