

# Supply & Chain Optimization

## An Overview of RosettaNet e-Business Processes

By Malcolm Lewis

**B**usiness-to-Business (B2B) e-commerce promises to optimize product and service supply chains by replacing expensive and time-consuming physical inventory flows with automatic, system-to-system, real-time information flows. While an important part of the solution, standard inter-company document formats based on the XML are not the panacea for enabling this transformation. The key is the explicit definition and automatic implementation of standard business process models that describe the step-by-step exchange of these XML documents. That's what may finally unlock the significant business benefits of end-to-end supply chain optimization.

### Supply Chain Optimization Challenge

Manufacturers, suppliers, distributors, and resellers in the IT and Electronic Components (EC) industries are currently wasting billions of dollars a year through time and cost inefficiencies at every point across their extended supply chains. These inefficiencies are driven by the lack of industry-wide process and data standards that enable system-to-system automation of core supply chain processes such as catalog management, order management, inventory management, and customer service and support. Supply chain partners currently use slow and expensive manual collaboration techniques, such as phone

and facsimile systems, to exchange the information and transactions required to support such processes. The time and cost wasted by such manual techniques translate directly into lost or incorrect orders, late deliveries, high clerical and labor costs, excessive buffer and obsolete inventory costs, and ultimately, low customer loyalty and retention. Typical supply chain problems include:

- Manufacturers must maintain expensive buffer inventories because they can only guess at inventory levels and locations across the supply chain. They lack agreement on how a part number is defined or a standard process to automatically query inventory levels in a partner's inventory system.
- Distributors waste time and money trying to compare tens of thousands of products from hundreds of manufacturers because each manufacturer has its own unique part number scheme and proprietary scheme for describing product structures.
- Resellers waste valuable clerical resources on learning and using product ordering and return processes that are unique to each distributor and manufacturer. They would do better to focus those resources on sales or customer service.

Manual supply chain collaboration is simply too slow and expensive for com-

panies seeking to compete successfully in highly competitive industries with thin profit margins. To remain competitive, companies need an end-to-end supply chain optimization solution. Such a solution should provide global visibility and control across the entire supply chain. Specifically, companies must replace slow, expensive manual collaborations with fast, low-cost electronic collaborations. Each supply chain partner's internal IT systems should be able to automatically exchange business information and transactions with any other partner's systems in real time.

### Supply Chain Optimization Benefits

The benefits of end-to-end supply chain optimization are enormous. Improved demand visibility up the supply chain lets manufacturers, distributors, and resellers make informed forecasting, production, and stocking decisions based on accurate, timely demand information. Results can include dramatic reductions in inventory carrying costs and obsolescence costs. Improved supply visibility down the supply chain lets consumers, resellers, and distributors make informed purchase decisions based on accurate product, pricing, and availability information. This results in fewer orders for the wrong product and fewer product returns. Automating the flow of supply and demand information up and down the supply chain also reduces the significant clerical costs associated with manual communications. Such communications involve phone and facsimile exchanges, manually re-keying information into IT systems, and manually handling business exceptions such as lost, late or, inaccurate orders.

### Enabling Supply Chain Automation

Enabling IT systems to exchange information and transactions electronically poses several significant business and technology challenges. First, it requires supply chain partners to agree upon explicit and unambiguous standards that specify precisely the data that these systems can exchange and — more important — the step-by-step process by which they must exchange data. Second, it requires a global communications network that provides a low-cost medium for secure, reliable data exchange between each supply chain partner and

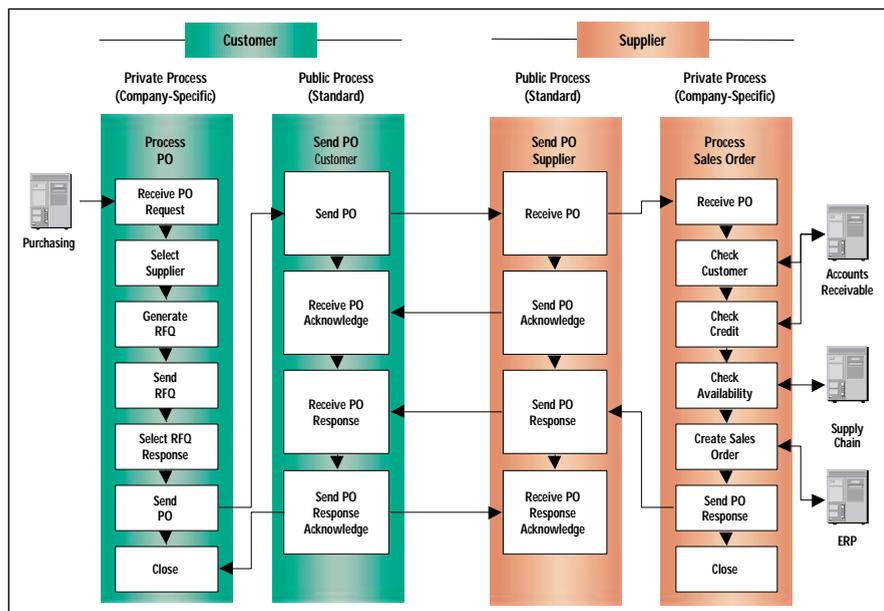


Figure 1 — Public and Private Business Processes for Purchase and Sales Order Processing

their internal IT systems. Finally, it requires a software solution that sits between each trading partner's internal IT systems and the B2B communication network. The software solution implements the business process and data standards to enable automatic exchange of information and transactions.

### Taking the First Step

The first and most obvious prerequisite for supply chain optimization is for trading partners to agree upon a common standard for describing and exchanging information and transactions. Initial attempts to impose such data standards revolved around Electronic Data Interchange (EDI). Standards bodies such as the American National Standards Institute (ANSI) defined standard formats for common business documents, such as purchase orders and invoices, to enable electronic exchange of these documents over private Value-Added Networks (VANs). While an obvious improvement over manual techniques, EDI has seen limited adoption due to the complexity and cost of the software required to interface internal IT systems to VANs. Also problematic is the high, transaction-based costs of the VAN itself.

Fortunately, a simple, low-cost alternative to EDI has arrived in XML and the Internet. XML-encoded business documents are much simpler to understand and easier to customize and extend. Moreover, XML documents can

travel the public Internet, which represents a significant advantage over EDI. The latter method requires expensive VANs with limited reach. Since XML provides little more than an alphabet to describe business documents, companies augment XML with the use of Document Type Definitions (DTDs) to unambiguously describe the structure of XML-encoded business documents. The use of XML, DTDs, and the Internet is a step toward convenient, low-cost exchange of information and transactions between trading partners. It's not, however, a panacea for end-to-end, system-to-system supply chain automation.

### Business Process Standards Needed

For companies' internal IT systems to automatically exchange data, they must not only have explicit agreement on data format and communication network — for example: XML documents over the Internet — but also explicit agreement on the step-by-step process for data exchange. These business processes fall into two broad classes: “public” (or partner-facing) processes and “private” (or system-facing) processes.

Public processes describe the processing steps required to exchange information or transaction with a trading partner. Typically, a single business activity, such as the transmission of a purchase order, will require two distinct public processes. One is for the company sending the purchase order (e.g., a

customer); another is for the company responding (e.g., a supplier). Successful completion of the transaction requires both companies to complete their role by executing all steps in their respective public process. Collectively, public process standards, and the associated data format standards, provide a clearly defined interface for automated, system-to-system exchange of information and transactions.

Unlike public processes, private business processes are unique to each trading partner. Private processes define the processing steps required to move data between a company's partner-facing public processes and its internal IT systems. A typical private process, such as the processing of an inbound sales order, will often involve multiple processing steps that almost always vary among companies.

On receipt of a purchase order, for example, one company may need to validate the customer's credit worthiness against its billing system, check the availability of the requested product or service, and create a new sales order. Another company may have a totally different private process for handling the incoming order. Private processes are often much more complex than public processes. Automating these private processes and linking them into internal IT systems is often the most difficult, time-consuming task in supply chain optimization.

Figure 1 shows the concepts of public and private processes. The thick arrows show the flow of data between private and public processes within and between two trading partners. This illustrates the need for explicit business process management to control and coordinate the flow of information and transactions.

## The RosettaNet e-Business Standard

RosettaNet is an independent industry consortium formed in 1998 by leading manufacturers, suppliers, distributors, and resellers in the IT industry. The group seeks to address supply chain optimization. Assuming the B2B communications network will be the Internet, RosettaNet has developed a comprehensive set of standards and

guidelines for automatic, system-to-system exchange of business information and transactions between partners linked by the Internet. Notably, RosettaNet was



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the first e-business standards organization to recognize the importance of defining B2B process standards in addition to B2B data standards. RosettaNet focuses exclusively on the public (partner-facing) business processes that describe the step-by-step exchange of business data between partners' internal IT systems. RosettaNet makes this important delineation because private (system-facing) processes are invariably unique and, therefore, impossible to predict and standardize.

The RosettaNet standard is divided into three broad groups of data and process specifications: RosettaNet Business and Technical dictionaries, the RosettaNet Implementation Framework (RNIF), and RosettaNet Partner Interface Processes (PIPs).

**RosettaNet Business and Technical Dictionaries** — The RosettaNet business and technical dictionaries define common properties for products, trading partners and business transactions. The technical dictionary specifies common properties for IT products to make it easy for companies to query and compare the pricing and availability of similar products from multiple vendors. The business dictionary defines common properties for trading partners and transactions to make it easy for companies to identify each other and complete transactions. These dictionaries, coupled with the RNIF, provide a common

foundation for each RosettaNet PIP.

**RosettaNet Implementation Framework** — The RNIF provides specific details on how to implement the RosettaNet process and data standards. The standard assumes partners will use XML documents and the Internet for B2B information exchange and transactions.

**RosettaNet PIPs** — RosettaNet PIPs define the specific sequence of steps required to complete a B2B process such as the distribution of catalog update or placement of a purchase order. They also define the specific information exchange and transactions each step in the business process triggers. RosettaNet PIPs defines the public processes — and related data — required to conduct common business transactions electronically over the Internet. RosettaNet uses the Unified Modeling Language (UML) to define common B2B processes, and XML to describe shared B2B data formats.

As of February 2000, RosettaNet has published detailed specifications for the following 10 PIPs:

- PIP1B1 — manage product information subscription
- PIP2A1 — distribute new product information
- PIP2A2 — query new product information
- PIP2A5 — query technical information
- PIP2A8 — distribute product SKU
- PIP3A2 — query price and availability
- PIP3A3 — transfer shopping cart
- PIP3A4 — manage purchase order
- PIP3A5 — query order status
- PIP3A6 — distribute order status.

## Implementing RosettaNet

Implementing RosettaNet requires a software solution that provides a complete, flexible, scalable implementation of all RosettaNet solution components, including those listed and described in Figure 2.

## e-Business Platforms

e-Business platforms are an emerging category of e-business infrastructure software. They provide an excellent foundation for implementing B2B e-commerce

RosettaNet Component	Purpose
Business Dictionary	Define standard properties for product information
Technical Dictionary	Define standard properties for trading partner and transaction information
Message Format and Transport	Exchange information and transactions as XML messages over the Internet
Message Validation	Ensure all messages include all required fields and that each field has the correct length and data type, and that each field contains a valid value
Security	Ensure all messages are fully authenticated, encrypted, authorized, and non-repudiated
Trading Partner Management	Manage all trading partner information required for business-to-business collaboration, including Web server URLs, digital signatures, and digital certificates
Business Logging	Log key business events, including inbound and outbound messages and non-repudiation
Exception Handling	Manage all exceptions related to message format, transport, validation, and security
Cross-Reference Mapping	Map internal company, location, product, and product structures to RosettaNet standard DUNS, DUNS+4, UNSPSC, and GTIN codes
End-User Access Control	Control access to RosettaNet implementation solution
RosettaNet PIPs	Control and coordinate the exchange of messages between internal IT systems and trading partners to support specific business-to-business processes such as catalog management, order management, inventory management, and customer service and support.

Figure 2 — RosettaNet e-Business Standard Components

standards such as RosettaNet. These e-business platforms provide the following core functionality required to implement any e-business standard:

- **Business Process Management (BPM)** — This component lets companies model and automate “public” business processes that control and coordinate partner information exchange and transactions. In the case of RosettaNet, these public process models are represented by RosettaNet PIPs. Companies also use the BPM component to model and automate “private” business processes that move information and transactions in and out of internal IT systems.
- **B2B Integration** — This component enables secure, reliable partner information exchange and transactions over public networks such as the Internet. Vendors typically provide all the protocol translation and content mapping services required to map internal information and transactions to the various protocols and data formats. These include multiple XML and EDI dialects.
- **Enterprise Application Integration (EAI)** — This component enables secure, reliable movement of infor-

mation and transactions in and out of internal business applications. As with the B2B component, vendors typically provide all the protocol translation and content mapping services required to map internal information and transactions to the various protocols and data formats.

In addition to the foundation functionality described above, a software solution for implementing the RosettaNet standard must also provide a set of common services that run on top of the e-business platform. These services simplify the configuration, execution, and administration of the RNIF and RosettaNet PIPs. These services should include message formatting, transport and validation, message authentication, encryption, authorization and non-repudiation, business activity performance controls, and message exchange controls. Ideally, the solution should provide a Web-based administration console and set of services for trading partner management, business event logging, exception handling and notification, cross-reference mapping, and end-user access control.

Finally, a RosettaNet solution must provide a complete implementation of the

RosettaNet PIPs as specified by the consortium. These are typically implemented as a suite of pre-built business process models that run on top of the common services that implement the RNIF.

## Conclusion

RosettaNet is significant in that it provides the first e-business standard to recognize that automatic, system-to-system, real-time partner information exchange and transactions require an explicit standard for both B2B data formats and B2B process flows. Companies that implement the RosettaNet standard may finally achieve the Utopian business dream — end-to-end optimization of their product and service supply chains. 

## About the Author

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