

Barnes & Noble Inc.

Electronic Data Interchange (EDI)

A Brief Introduction to EDI

Summary

This Brief Introduction to EDI is intended to assist prospective Barnes & Noble trading partners who have limited experience in Electronic Data Interchange (EDI) to gain a beginning background in the field of EDI and a knowledge of the Barnes & Noble EDI Program. Key elements of EDI practice and of the particular Barnes & Noble program are summarized below and discussed briefly on the following pages. Additional sources of information are listed at the end of the document.

A Definition of EDI

EDI (Electronic Data Interchange) is the exchange of business data electronically (usually via phone lines) directly from computer to computer rather than on paper.

Why Barnes & Noble is Using Electronic Data Interchange (Page 3)

Barnes & Noble has embarked on an EDI Program so that we can replace sales in our stores as rapidly as possible with a minimum of held inventory and at as low a cost as possible to all parties to the distribution process. We expect that both we and our vendors will achieve a number of long-term benefits from the EDI program.

Most major retailers, especially mass merchandisers, are very heavy users of EDI; estimates ran as high as 30,000 participating organizations in 1995. At Barnes & Noble, we are communicating electronically with approximately 150 vendors. EDI is rapidly becoming as integral a part of doing business as the telephone and the computer.

ASC X12 National Standards (Page 3)

ASC X12 is the committee of the American National Standards Institute (ANSI) that set the technical standards for Electronic Data Interchange in the United States. Hence EDI as practiced in this country is often referred to as "X12".

Business Reasons for ASC X12 Standards (Page 4)

Technical standards define how computers "talk" to each other; what "manner of speaking" they use. Good standards provide for efficient and flexible operation. Standards developed by broadly-based groups relieve companies of the burden (expense) of working out with each other how they will intercommunicate. National standards also facilitate intercommunication between organizations in different industries.

Direct Connection Vs. Value-Added Networks (Page 5)

Earlier electronic communications (other than magnetic tape) between organizations usually employed direct connections of some sort between companies. It was necessary for Organization B to be ready to receive when Organization A transmitted. Since there is such a large number of potential EDI trading partners, providing direct connections between them all would be impractical; something on the order of having direct lines between everyone who might call each other on the telephone.

Value-Added networks not only interconnect organizations, they also store data in "mailboxes" so that each organization need have only one connection to the network and organizations need not coordinate (schedule) transmissions.

EDI "Translators" (Page 7)

The ASC X12 national standards are different from the proprietary (internal) ways in which data is stored and used in almost any organization. Rather than change internal practices to match the standards, most organizations use translators which convert (or "translate") data in proprietary form to the ASC X12 standards for interchange.

Functions (Transactions Sets) Included in the Barnes & Noble EDI Program (Page 7)

In EDI terminology, "transaction sets" are the standards for a particular function. Shown below are the ASC X12 Transaction Sets and the corresponding Functions which are or will be included in the Barnes & Noble EDI Program.

Transaction Set 810	Invoice
Transaction Set 820	Remittance Advice
Transaction Set 832	Price/Sales Catalog (Title Status)
Transaction Set 850	Purchase Order
Transaction Set 852	Product Activity Data
Transaction Set 857	Ship Notice/Invoice
Transaction Set 864	Location/Address (Store SAN and Street Address)
Transaction Set 997	Functional Acknowledgment

Re-Engineering

Although EDI is a method for interchanging data, its impact can (and should) go far beyond that. Since completely new ways of operating a business are now possible, the business may "re-engineer" its processes to spend fewer resources on the mechanics of operation and more resources on business direction. Re-engineering your business is out of the scope of the Barnes & Noble EDI program, but participation in the program does provide you the opportunity to do so.

Why Barnes & Noble is Using EDI

Barnes & Noble, like most other businesses, traditionally conducted a great many of its external transactions through paper exchanges (i.e., purchase orders, invoices, checks for payments, etc.). Although we have used computers extensively to facilitate the various processes, there is still a significant cost in both time and money when paper documents are produced, handled, or used for data input.

Our experience over the years in sending purchase orders and receiving invoices via magnetic tape with many of our vendors demonstrated that electronic exchanges can provide both efficiencies and more timely action (such as prompt reorders). The methods we used for magnetic tape interchanges served us and our vendors well.

However, the older approaches became increasingly obsolete and inefficient given the technology of the 1990's. In addition, the functions provided by the older methods were limited, and developing new functions using them was very time consuming.

Fortunately, groups in other business areas have faced similar challenges and opportunities, and have addressed this situation as described in the following section. Thus Barnes & Noble and you, our trading partner, can take advantage of work already done and achieve not only more efficient methods, but also new functionality.

The speed with which purchase orders, invoices, and other business transactions can be exchanged and the fact that they are in electronic form are obvious advantages of EDI. The potential to obtain and disseminate point of sale data in a timely manner is an example of new functionality. Timely sales information can support quick and appropriate replenishment, accurate reprints by the publisher, etc.

The Barnes & Noble EDI program began in 1993. As of late 1996, we are actively sending and receiving EDI transactions with over 150 vendors.

The ASC X12 National Standards for EDI

Various forms of electronic communication between computers have been used for years, beginning with the physical transportation of punched cards from site to site. During the past few years, however, a specific method of electronic communication has become the method of choice in the United States, Canada, and throughout the world.

The ASCX12 National Standards for EDI, continued

This method of communication is known in the United States as ASC X12 or "X12" from the name assigned to the committee designated by the American National Standards Institute (ANSI) to establish the technical standards for it. ASC stands for "Accredited Standards Committee", and X12 is simply the designation for the committee which has responsibility for Electronic Data Interchange.

When the term "EDI" is used in the United States today, the reference is most likely to data exchanges employing the ASC X12 standards.

Business Reason for the ASC X12 Standards

It is easy to get immersed in the jargon and other technical aspects of the ASC X12 standards. However, the reasons for their development and adoption are very definitely business reasons; they provide a highly efficient and flexible (and thus lower cost) means of readily establishing business data communications between organizations doing business with each other.

ASC X12 transmissions are efficient and flexible because only that data required for a particular business purpose need be sent. Older transmission methods frequently sent much more data for the same purpose, including data that *might* be needed.

Older data transmission methods were usually based on proprietary approaches which were supported by a single company or industry. The venerable formats developed by the Book Industry Systems Advisory Committee (BISAC) are examples of industry-specific methods. Although the BISAC standards served the book industry well, they became increasingly obsolete. Organizations in the book industry faced limitations, and those desiring to conduct business across industries faced the problem of supporting a multitude of incompatible approaches.

The adoption of national EDI standards in the form of ASC X12 has permitted organizations in many industries to use the single standards agency (ANSI) to develop and maintain standards for EDI functions. BISAC has adopted subsets (parts) of these standards to address the needs of the book industry. However, organizations who implement ASC X12 standards for EDI can do so with the knowledge that they will be able to communicate with other organizations using ASC X12, whether these organizations are in the book industry or not.

Direct Connection Vs. Value-Added Networks

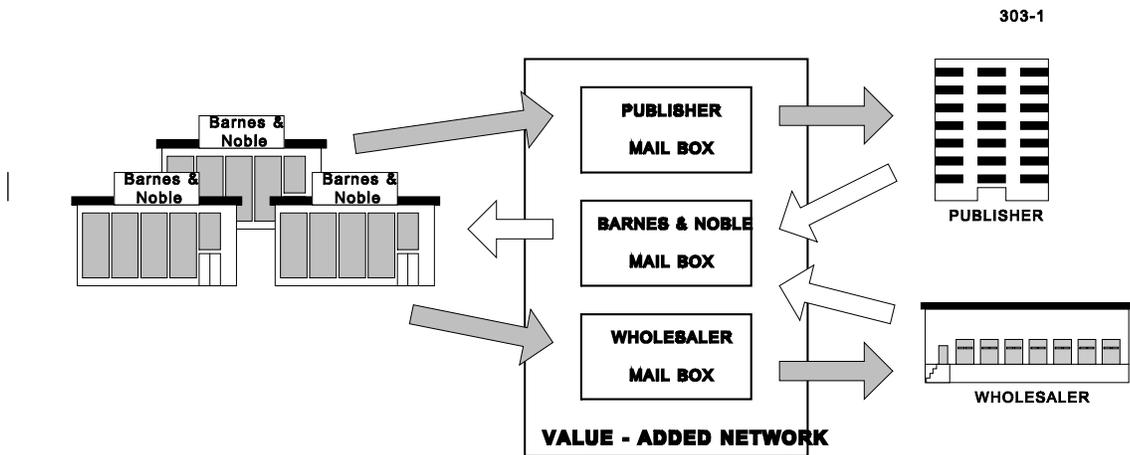


Figure 1 - Electronic Data Interchange Using a Value-Added Network

A key element in the Barnes & Noble EDI Program is the Value Added Network (VAN). A VAN consists of both telephone circuits and computer storage; a simplified picture of the arrangement is shown in Figure 1. It would be possible, theoretically, for each trading partner to be connected directly to Barnes & Noble. However, just as few companies or persons have direct voice telephone connections with each other (since the cost and complexity of doing so would be extreme), few companies have direct EDI interconnections.

Barnes & Noble will transmit data, such as purchase orders, to your electronic "mailbox" on your VAN. You will then call in to the network at a time which suits your needs and pick up the purchase order. This process is shown by the shaded arrows in Figure 1 above. You will send invoices to the Barnes & Noble mailbox in a similar manner, as indicated by the open arrows in Figure 1.

EDI Translators

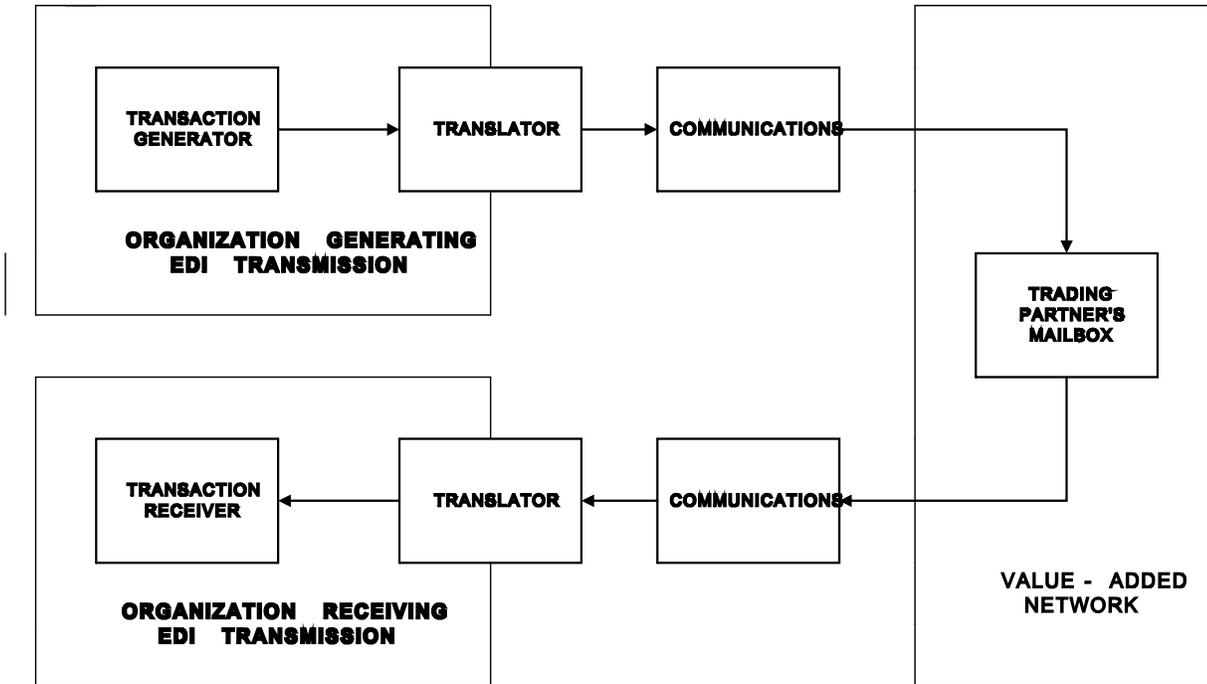


Figure 2 - EDI Transmissions Using Translators

When implementing EDI, few organizations find it necessary to change their internal databases or the structures (formats) used to pass data from one internal system to another. Nor is it generally necessary to change the format of data intended for transmission to others, so long as a process known as "translation" is employed.

Since EDI defines a common language (ASC X12 standards) most organizations use "translators", which are commercial software packages designed to "translate" or convert internal data to ASC X12 standards. Figure 2 shows the role of a translator.

The process of setting up a translator (of telling it what the translation will be) is called "mapping". Mapping for communication within the same industry is usually very straightforward and in many cases no further mapping may be required. Communication outside an industry may require additional further mapping. However, much of the initial work will usually apply to the new trading partner regardless of industry.

Functions Included In The Barnes & Noble EDI Program

Store Location/Address (Transaction Set 864)

- Location/Address data for existing and new stores, such as SAN, Store Number, Shipping Address, Barnes & Noble Division, etc., are transmitted.

Purchase Order (Transaction Set 850)

- For Combinable (weekly) Purchase Orders, EDI simply replaces paper; the orders are available earlier and in electronic form ready for processing by the vendor.
- Spreadsheet orders and/or customer special orders, in the past sent on paper only, can be sent daily via EDI.

Functional Acknowledgment (Transaction Set 997)

- For Purchase Orders, the Functional Acknowledgment assures Barnes & Noble that you have received the order; it does not tell us whether or not you can fill it.
- For Invoices, the Functional Acknowledgment assures you that Barnes & Noble has received your invoices; it does not indicate business acceptance of the invoice.

Invoice (Transaction Set 810)

- Invoices sent via EDI replace invoices printed on paper or sent on magnetic tape..

Remittance Advice (Transaction Set 820)

- A Remittance Advice sent via EDI will enable you to apply payments electronically rather than by manually keying data from paper check stubs.

Sales/Inventory Reporting (Product Activity) (Transaction Set 852)

- Weekly summary (at the Barnes & Noble Division level) reporting of the Sales and Inventory Position of your titles at our stores can be made available at the direction of Barnes & Noble Merchandising.
- Store level reporting can also be available, again at the direction of Barnes & Noble Merchandising.

Functions Included In The Barnes & Noble EDI Program, continued

Price/Sales Catalog (Title Status) (Transaction Set 832)

- Title information will be sent by you to Barnes & Noble using EDI. After a review of the information by a staff member, it will update our title database.
- Price and Status changes are expected at no greater than weekly intervals.

Purchase Order Acknowledgments (Transaction Set 855)

- Unlike the Functional Acknowledgment, the Purchase Order Acknowledgment informs Barnes & Noble of the action the vendor will take on indicated line items within the Purchase Order (e.g., cancellations, backorders, etc.).
- This informing will be done by exception; the Purchase Order Acknowledgment will provide timely notification of what **will not be supplied** by a vendor, what may be permanently unavailable, or which ISBNs have changed
- Barnes & Noble expects that Purchase Order Acknowledgments will be a significant future part of our EDI program

The Advance Ship Notice/License Plate Receiving Function

The Advance Ship Notice (ASN) is such a key element of the Barnes & Noble EDI program that this function is addressed separately. The function is utilized in a process known as "License Plate" receiving, which is shown graphically in Figure 3 on the following page.

- The Advance Ship Notice (ASN) is also known as an "electronic packing list" Because it provides an item by item listing of the contents of each carton in a shipment.
- The shipper must identify by ISBN all the items going into each carton, either by prediction or by scanning the bar codes on the items as they are put into the carton.
- The shipping label for each carton will include a bar code containing a unique number (the "license plate" number).
- The license plate number will also be included as a part of the electronic packing list (ASN) for each carton.

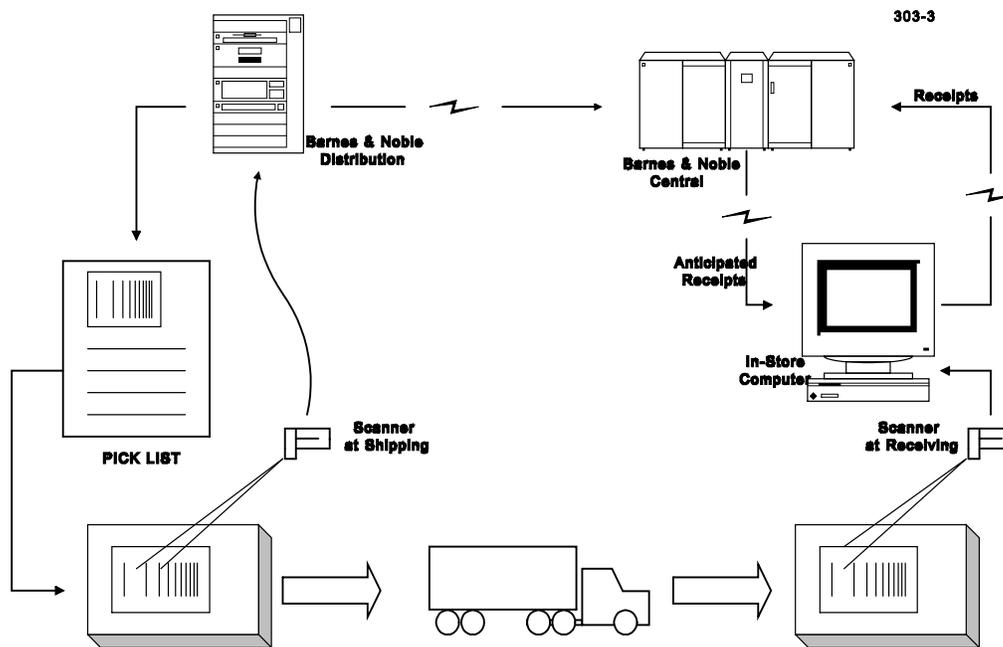


Figure 3 - Advance Ship Notice and License Plate Receiving

- The Advance Ship Notice will be transmitted via EDI by the vendor to the Barnes & Noble central data center (not to the store).
- The central data center will collect and group ASNs for each store.
- The Advance Ship Notice will be transmitted to the appropriate store and held until the corresponding carton arrives.
- When the carton arrives in the store, the "license plate" number on the shipping label will be scanned, and the store computer will retrieve the electronic packing list associated with that license plate number.
- The ISBNs on the electronic packing list will then be processed by the stock receiving routine in the store computer (posted to on-hand) and the books can be shelved with no further delay.

Sources of Further Information

DISA

Data Interchange Standards Association, Inc.
1800 Diagonal Road
Suite 355
Alexandria, Virginia 22314-2852
(708)548-7005

BISAC

Book Industry Systems Advisory Committee
160 Fifth Avenue
New York, NY 10010
(212)929-1393