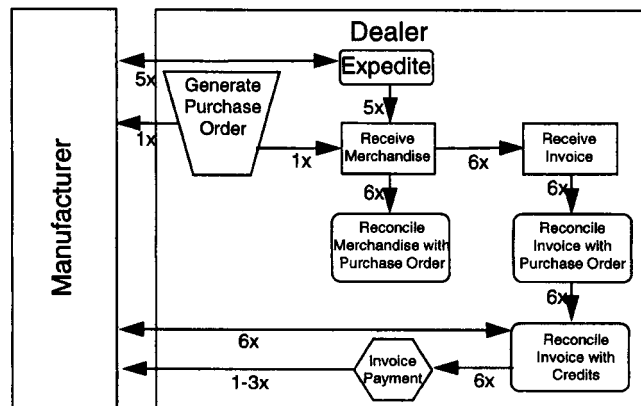


Chapter 1**Background &
Introduction****Introduction to EDI & Overview**

The term “Electronic Commerce” is defined as the information technologies and business processes allowing companies to conduct business electronically. It includes capabilities such as EDI (Electronic Data Interchange), E-mail, facsimile, EFT (Electronic Funds Transfer), shared data bases, and on-line services access, such as the Internet.

Before Electronic Commerce — In order to gain an understanding of electronic commerce’s potential, let’s take an example of a business process in the graphic communications industry. We’ll use the example of a dealer ordering product from a manufacturer.

Current Business Model



x = number of times a step or communication typically takes place to complete business process.

The dealer determines the need for a normal restocking order with the manufacturer. The order consists of multiple products, i.e., several film types, plates, etc. This is a typical order size, 30-40 line items.

1. The dealer’s purchasing agent creates a purchase order by keying all items into the dealer’s computer system.
2. The dealer’s computer system prints out the purchase order.
3. The purchase order is then faxed to the manufacturer. Upon receipt, it is rekeyed into the manufacturer’s order entry system. The “confirming” copy of the purchase order arrives in the mail at a later date.
4. Numerous phone calls are made to determine and negotiate prices, back-orders, and delivery issues.
5. The order is shipped to the dealer’s warehouse.

Opportunities for Improvement

6. Upon arrival, the order is unloaded from the truck. The pallets are broken down, and the product is sorted and weighed. Counts are taken, and the product receipt document from the dealer's system is validated.

7. The physical receipt information is re-keyed into the dealer's system, where further reconciliation is done against the purchase order. Follow-up calls are placed to the manufacturer to resolve discrepancies.

8. The manufacturer's invoice arrives via the mail and is reconciled against the receipt information and the purchase order. If issues or discrepancies arise, further phone calls and discussions occur with the manufacturer. Once issues are resolved and the credit terms are reached, the invoice is paid.

Of course, the above scenario is overly simplified. Usually, somewhere along the line a customer needs a key product from the order. As the dealer can't be sure when it may arrive from the manufacturer, expediting occurs to fill the customer order. All too frequently, this situation tends to be the norm rather than the exception. Numerous phone calls are made. The paperwork and order status become hopelessly jumbled, and many additional labor hours are spent in order tracking, status checking and order reconciling. Credits, adjustments, partial shipments and partial payments add to the overall confusion.

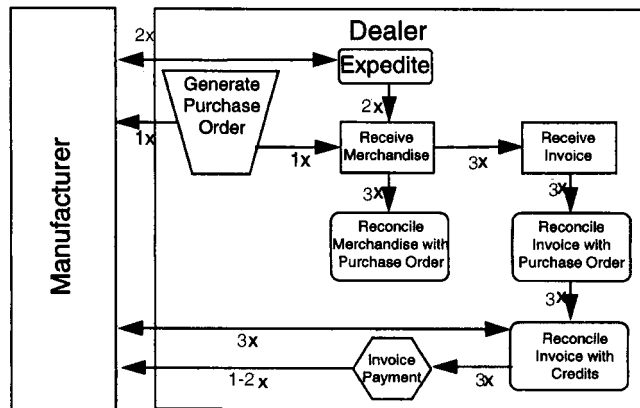
While each dealer and manufacturer does things slightly different, and while order types and processing differ, the above scenario points out several opportunities for improvement:

- The actual order is re-keyed three times.
- The order is reconciled at least three times.
- Order status, including shipping, backorders, and availability is a labor-intensive, complex and confusing process.
- Total dealer and manufacturer labor for this order could range from 10 hours each, to up to 20 hours each if expediting occurs. The elapsed time for this order could be as low as a week if everything went smoothly, and up to 4 weeks if expediting and backorders are necessary.
- The order process tends to lose information as it unfolds. Due to all of the problems that arise during expediting, much of the order fulfillment and tracking process becomes verbal; the true status of the order and all of its line items, backorder status, shipping status, etc., are no longer contained in a computer system, and reconciliation becomes even more difficult.

EDI Concept

Using Electronic Commerce — Now take the same scenario and envision a future when NAGASA's membership is using electronic commerce.

Current Business Model



x = number of times a step or communication typically takes place to complete business process.

Note: reduction in values in EDI Business Model

Since order status information can be received and posted automatically, tracking time and reconciliation is significantly reduced.

1. An order is entered into the dealer's purchasing system. The dealer's system also has accurate, up to date standard manufacturer pricing, fed electronically into the dealer's system.
2. The order causes the dealer's computer to generate an electronic order message, which is sent to the manufacturer.
3. Upon receipt of the dealer's electronic order message, the manufacturer's computer issues an electronic order acknowledgement record.
4. Prices, backorders and delivery dates are communicated back to the dealer via EDI. This information is linked into the dealer's computer system.
5. Specific questions can be sent by the dealer to the manufacturer via electronic mail. Responses are communicated in the same way.
6. As the order is shipped from the manufacturer, all cartons are bar-coded with order and shipping information using the GIBC (Graphics Industry Bar Code) standard.
7. An electronic notification of what was shipped, how it was shipped, and the estimated time of arrival is sent to the distributor.
8. When the order arrives at the dealer, the individual cartons are scanned using a hand-held bar code reader.

9. The information collected by the bar code reader is reconciled against the purchase order and the advanced shipping notice that was electronically received earlier.

10. The invoice from the manufacturer is sent electronically. Again, no re-keying is necessary; the information flows into the dealer's system and is automatically reconciled against the advance shipping notice, physical receipt, and purchase order. Once payment terms are reached, the dealer notifies its bank to issue electronic payment from its account to the manufacturer.

While backorders and expediting may still occur, the status of the order is tracked in computers, not just through telephone calls. The result is more accurate information regarding backorders and expected deliveries. Since order status information can be received and posted automatically, tracking time and reconciliation is significantly reduced.

*Profitability,
Accuracy &
Efficiency*

Benefits of Electronic Commerce

Electric commerce would strategically educate and enable NAGASA membership to *increase profitability, speed information exchange and strengthen the channel's competitiveness in involving the customer through electronic commerce*. These benefits are outlined in the Business Objective for Electronic Commerce endorsed by the NAGASA Electronic Commerce Committee.

Members can *increase profitability* in four ways:

- Drive out redundancy in the following areas:
 - In customer service / purchasing process, eliminate 90% of paper-based systems and telephone follow-up on order status.
 - In receiving process, reduce receipt processing time by 50%.
 - In accounts payable process, eliminate 90% of paper invoices.
 - Reengineer the purchase order to payment cycle to eliminate \$1.30 to \$5.50 per document*.
- Reduce cycle time — order submission to receipt of all pertinent information — from weeks or days to within 72 hours.
- Optimize inventory by reducing gross inventory, inventory handling and stock-outs.
- Decrease error rate from 10.1% (prior to EDI) to 4.4%*.

Members can *speed information exchange* in two ways:

- Expand and quicken channels of communication between manufacturer and dealer through electronic bulletin boards and networking.
- Boost customer satisfaction through reduced information cycle time for product availability, delivery date and price.

* "The Real Facts About EDI in 1994 by Daniel M. Ferguson, President of the EDI Group, Inc., EDI FORUM, 1994 (a survey of 1,560 U.S. EDI users)

Because more accurate and timely information is shared, EDI partners can plan instead of react. EDI also allows the partners to use their employees more effectively, as a computer can perform many non-value added activities, such as price checking and matching purchase orders, receipts, and invoices.

EDI as a business operating procedure improves customer service, improves accuracy and reduces operating costs.

Improved Business Operating Procedures. Significant benefits result from the adoption of EDI as a standard business operating procedure: improved customer service, improved accuracy, and reduced operating costs.

There is *improved customer service* due to the following results:

- Accuracy of business transactions increases.
- Audit trails of the entire business transactions improve.
- On-line, real-time communication improves the timeliness of information.
- Customers can buy from a variety of suppliers using a common set of business processes and transactions.

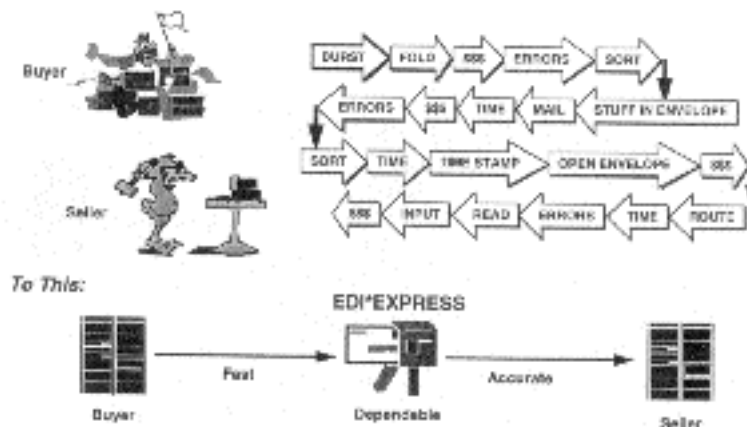
There are *improved accuracy* due to the following results:

- Transactions are entered only once, at the source, and are shared electronically between computers.
- As EDI transactions are linked directly to a company's computer system, transactions automatically flow into the computer without human intervention.

There are *reduced operating costs* due to the following results:

- Opportunities for eliminating redundant data entry.
- Improved accuracy reduces discrepancies among the ordering, receipt and invoicing processes, and the labor involved in reconciliation.
- Reduced cycle times and increased accuracy will result in improved inventory accuracy and planning.

Why EDI? To change this:



The Committee conducted a cost analysis. The chart below outlines cost savings to implement EDI.

Role in the Business

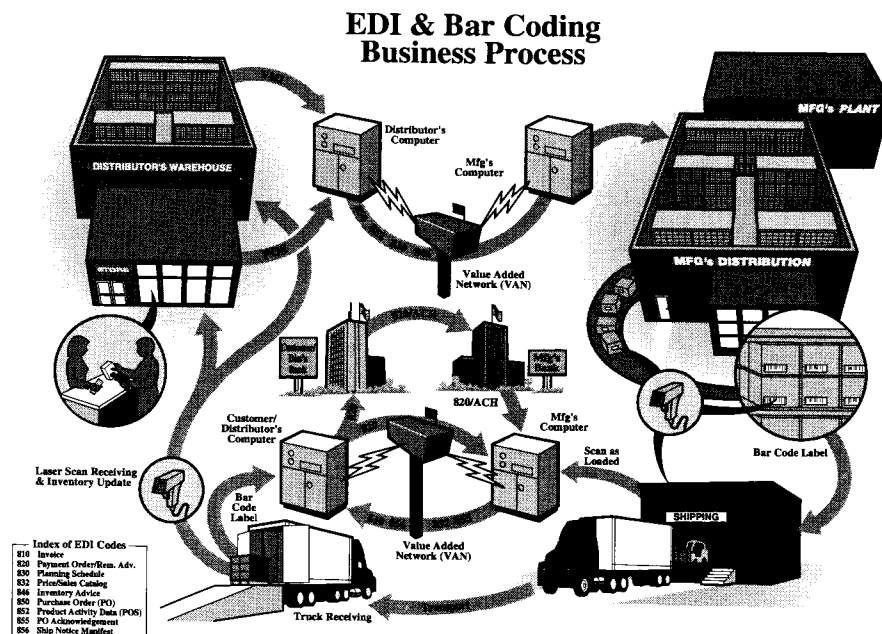
Future Operating Procedures — How will EDI change the standard operating procedure for the graphic communications industry? Here are four areas that will be affected:

■ *All key business transactions will be communicated via industry-standard EDI transactions.* While manufacturers may have unique offerings and programs, the business transactions for these programs will be standard (i.e., an advance ship notice from manufacturer A will be the same as manufacturer B, etc.); dealers only have to design their system to handle one type of transaction, not multiple ones. All major business transactions will be standardized, including purchase orders, invoices, advance ship notices, dealer sell-through information, credit transactions, electronic funds transfers, etc.

■ *All manufacturers will conform to GIBC bar coding standard.* Tight linkages between bar codes and EDI transactions will result in dramatic improvements in efficiency and accuracy for receiving, warehousing and shipping processes.

■ *Price changes from manufacturers will be received via standard EDI, allowing this information to be automatically updated in a dealer's computer system.* Receiving this information via EDI will eliminate manual re-keying, which will improve productivity, elapsed time, and accuracy.

■ *E-mail and bulletin boards will begin to emerge as standard ways of communicating between manufacturers, dealers and end users.* These forms of electronic communications will be used to communicate price and product catalogs, technical information, MSDS's, etc.



The Dealer-Customer Relationship — The example shows how EDI and bar coding can improve the dealer-manufacturer relationship. Electronic Commerce has additional value in linking dealers with their customers. Purchase orders, pricing information, and invoices can all be transmitted via EDI, delivering similar benefits, such as improved cycle time, accuracy and efficiency.

Achievable Benefits — Are these benefits achievable? The answer is clearly yes! The scenario only scratches the surface of the potential of electronic commerce. EDI, bar coding and E-mail are current technologies that have been proven in many industries. Several manufacturers and dealers in the graphics arts industry are already using some of the above transactions and processes.

It is estimated that there are over 40,000 companies in the world currently using EDI. Bar coding and EDI technologies are not new; bar coding was developed in 1962 by Sylvania Corporation as a way to scan railroad cars in motion. Early proprietary EDI transactions started in the early 60's. In 1979 the American National Standards Institute (ANSI) chartered an Accredited Standards Committee X12 (ASC X12) to develop uniform standards for EDI of business documents. The path to a successful implementation has been traveled by many before us.

EDI in Other Industries — Here are some examples of where other companies and other industries have significantly improved their costs and distribution channels:

The Ocean Carrier's Electronic Access Network (OCEAN) and EDI software package that has been initially offered by 7 major ocean carriers allows their international transportation customers to book and track ocean shipments with different carriers using the same interface and EDI. Using OCEAN, customers can book shipping orders, confirm instructions, and receive a bill of lading, arrival notice, cargo status, and invoices.

EDI and bar coding can also benefit dealers and their customers. The Bergen Brunswig Drug Company, a large distributor of pharmaceuticals for drug stores and hospitals, radically improved its customer service levels by implementing EDI and bar coding both at their distribution centers and with their sales force. Before electronic commerce, a typical order from a drug store was done by a salesperson calling on the drug store and writing up a detailed order. This is a time-consuming, error-prone process, requiring the time of the salesperson, the druggist, and an order-entry clerk at headquarters. Sometimes a salesperson would spend 70% of a sales call filling out forms. Today, hand-held bar code scanners are used by sales reps to take store inventory and automatically transmit orders. Bergen-Brunswig has also automated its distribution centers to utilize bar coding and EDI transactions. As a result of these initiatives, order cycle time has been cut by more than 50%, the order entry clerk position has been eliminated, errors (along with returns for incorrect orders) have been virtually eliminated, and sales per employee have increased ten-fold.

The entire health care industry is undergoing a second revolution around EDI. Baxter Healthcare Corporation gained a significant competitive advantage in the health care industry when they implemented a proprietary, closed order processing system called ASAP that locked in their customer base. Now, Baxter, along with the above-mentioned Bergen Brunswig Drug Company, and Eastman Kodak, amongst others, have agreed to standardize their EDI communications. Hospitals will have only one EDI system with which to interface, rather than a multitude of systems and formats from various suppliers.

Planning Your EDI Strategy

Strategic planning begins with the selection and education of people who will be leading the EDI effort. By gaining an understanding of how EDI can benefit your company, they will develop the commitment and expertise required for a successful implementation. We have found the following steps important to strategic planning.

7 steps to planning the EDI strategy are:

1. Establish an EDI steering committee.
2. Educate the EDI steering committee.
3. Develop an EDI strategy.
4. Create an EDI plan.
5. Assign an EDI coordinator.
6. Select an EDI implementation team.
7. Evaluate the EDI plan annually.

Establish an EDI Steering Committee. Senior management support is key to the success of an EDI initiative. A steering committee that represents all of your major business functions will be in the best position to identify those areas where EDI can make the greatest impact on the business. The first step involves identifying committee members and defining committee roles for planning and managing the EDI effort.

Educate the EDI Steering Committee. To learn what other companies are doing with EDI, enlist the assistance of experienced consultants, third parties, and peers in the industry. Sharing this expert knowledge with people in appropriate functional areas may avoid the pitfalls that other companies have experienced. It is important for the steering committee to focus its EDI education on business issues. Leave technical aspects of EDI to the implementation team.

Where can you find this expertise? NAGASA maintains a catalog of all dealers and manufacturers conducting EDI through adherence to NAGASA's Code of Practice. NAGASA is serving as a clearinghouse for information on companies specializing in EDI education. GE Information Services, NAGASA's value added network, will provide ongoing consulting, training and developmental programs. In addition, you can participate in NAGASA-sponsored conferences, seminars, and user group program.

Develop an EDI Strategy. Design the basic elements of the EDI strategy to reinforce the vision of how your company will do business in the future.

Review the strategic direction of your business. Understanding your business strategy will help you position EDI as a tool for achieving business objectives.

Review internal systems and business procedures. Once the steering committee reflects on the strategic direction of the company, it then analyzes current business procedures. The committee clarifies its understanding of the present process for creating business documents and the flow of these documents through the business process. Rules or procedures that affect each business document are included in the analysis.

Evaluate opportunities for streamlining business processes. Next the committee determines those information breakdowns among the current systems and procedures that could be improved or eliminated by EDI. Opportunities for EDI are greater than the simple replacement of inefficient manual workflows. When the committee applies a thorough understanding of EDI's capabilities, it can define applications that change processes and improve the way business functions are carried out. Start your evaluation.

Create an EDI Plan. A well-defined strategy that results in an action plan is key to achieving measurable success with an EDI effort.

Identify business process changes and system redesign activities. Determine how EDI can be integrated into existing systems and procedures. Identify the business applications that can be converted to EDI-based systems. Consider where you can design new procedures to take advantage of the benefits of electronic information flow.

Survey trading partner EDI capabilities. Determine which organizations have already implemented EDI and how they are doing it. Seek answers to such questions as:

- Which transactions are they implementing?
- Are they following industry guidelines? Which ones?
- Who is driving EDI within each trading partner?
- Have your trading partners developed their own EDI guidelines?
- Do your trading partners hold any expectations regarding your ability to implement EDI within a given time frame?

NAGASA has published *Code of Practice for Electronic Commerce* (NAGASA Standard 1995-3) to simplify and support this process. The Code is tailored to our industry to create a safe environment for using the new tools of electronic commerce. Firms become a signatory to the Code of Practice. NAGASA maintains and periodically publishes the list of signatories to help your company locate and target trading partners.

Develop EDI Transaction Priorities. Given the survey of trading partners and the analysis of your company's systems and procedures, develop a list of five or six transactions that appear to be mutually beneficial. The NAGASA Electronic Steering Committee completed transaction sets for all major business documents

in the printing and imaging distribution channel. The transaction sets were developed by both dealers and manufacturers to mutually meet their needs.

Determine Trading Partner Implementation Schedule. You may want to segment your EDI plan into customers, suppliers, freight carriers, and financial institutions. Decide what approach is best in selecting trading partners for your company.

Determine Requirements for Support Personnel and Technical Resources. Once the committee has identified all the major components of the EDI plan, it will be in a position to determine the human, financial, and technical resources required to implement the plan. Avoid the pitfalls of underestimating the amount of work needed to implement your plan. It's recommended that you allow more time and resources than you think you need.

Establish Measures of Success (e.g., goals and milestones). Following the above suggestions for developing the plan, ensure that everyone on the committee has a good understanding of what EDI can do for the company. The next step is to define these benefits in financial and strategic terms and to use these measures to determine implementation success. An excellent starting point for this effort is the Business Objective for Electronic Commerce endorsed by the NAGASA Electronic Commerce Steering Committee and Integrated EDI Scenario.

Assign an EDI Coordinator. The steering committee selects one individual to be responsible and accountable for the implementation of EDI. This person coordinates trading partner implementation and expansion programs. The coordinator leads the implementation team, assesses progress, and reports to the steering committee.

Select an EDI Implementation Team. The steering committee and the coordinator select an implementation team. It consists of people who represent those business functions within the company that will be impacted by EDI and technical people who will be responsible for implementation, operation, and ongoing support of your EDI system. Roles, responsibilities, tasks, and timetables for implementation are jointly agreed upon by the steering committee and the coordinator.

Evaluate the EDI plan annually. At the one-year anniversary of creating the EDI plan, the committee reviews progress and refines the plan based on actual experience. This evaluation of the EDI strategy and plan is repeated annually.